ТЕОРИЯ И ПРАКТИКА СОВРЕМЕННОЙ НАУКИ: ВЗГЛЯД МОЛОДЕЖИ

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KEY TRENDS OF MODERN ECONOMIC DEVELOPMENT

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Abstract. The relevance of this research topic is due to the fact that this article considers three blocks characterizing the changes in the modern economy. The development of the modern economy, as well as the entire financial system, is influenced by various factors, among the key ones are demographic, environmental and technological factors. The key trends characteristic of the current level of economic development and determining the future of the financial system are outlined. Examples illustrating the features of the indicated trends are considered in detail.

Keywords: modern economic system, information development of the world, trends, factors, digitalization.

КЛЮЧЕВЫЕ ТРЕНДЫ СОВРЕМЕННОГО ЭКОНОМИЧЕСКОГО РАЗВИТИЯ

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Аннотация. Актуальность данной темы исследования обусловлена тем, что в данной статье рассмотрены три блока, характеризующие изменения современной экономики. На ее развитие, а также всей финансовой системы оказывают влияние различные факторы, основные из которых – это демографические, экологические и технологические факторы. Обозначены ключевые тренды, характерные для текущего уровня экономического развития и определяющие будущее финансовой системы. Подробным образом рассмотрены примеры, иллюстрирующие особенности обозначенных трендов.

Ключевые слова: современная экономическая система, информационное развитие мира, тренды, факторы, цифровизация.

A new economy, a new world and a new demographic situation require a new financial system. Of course, digitalization can globally rebuild the structure not only of a particular company, but also of the entire financial sector, as well as the entire structure of the economy. Recently, the following trend has been observed: the share of emerging markets is gradually increasing, and this is typical for both the global economy and the financial sector. Various factors influence the development of the modern economy, as well as the entire financial system. Among the key ones, demographic, environmental, and technological factors can be distinguished. Changes that directly or indirectly affect the economic system, and as a result, the financial

sector, it seems possible to classify into three blocks: "digital economy", "transition stage" and the so-called "sustainability check". Let's look at each of the blocks in more detail and identify the key trends characteristic of the development of the modern economy in each of the blocks under consideration.

1. Digital economy.

First of all, digitalization processes are characteristic of the digital economy. One of the most obvious examples of the introduction of digital technologies into everyday life is the increase in the share of non-cash payments, since recently it is not so often possible to see consumers who prefer to withdraw cash and pay for goods, works, services with coins and banknotes. Increasingly, payments are made via bank cards or smartphones, as well as electronic gadgets with contactless payment function. For example, in 2020 there are more than 5 million in England. People have never used cash, preferring non-cash payment methods [1].

Particular attention should be paid to the development of the platform Economy, because it is online platforms that are able to create reliable and progressively growing connections between consumers of goods, works, services and their suppliers. It is online platforms that are able to offer comprehensive and cost-effective solutions for small and medium-sized businesses. An example of this is one of the largest companies in the field of financial services – Ant Financial, registered in China. This company does not have a single branch, but nevertheless, it was able to increase its customer coverage from 200 million customers to 1 billion. [1].

The sharing economy and gig economy, that is, an economy based on sharing and freelancing, can have a new trend on the entire nature of employment. This is a new economic business model based on the fact that with the help of modern digital technologies, users can exchange assets that they do not use. Currently, an asset can be understood as almost anything – from piano playing skills to furniture or a vehicle. The idea is that sometimes it is much more convenient for a consumer to pay for using a product than for owning it. For example, you may need a drill for repairs. A new drill is often quite expensive, and besides, you still need to be able to use it, so it is much more efficient to either call a master, or find a drill for temporary use at a construction tools sharing service.

Big data, that is, big data, which are structured or unstructured arrays of large amounts of data. For their processing, special automated tools are used that allow the processed information to be used for statistical purposes, analysis purposes, forecasting or making a certain decision. In 2021 alone, as much information was created around the world as there was not in all the previous 5,000 years. Daily more than 4 billion people use the Internet, which allows them to make a lot of "digital prints". The information generated daily can exceed 2 quintillion bytes of data [2].

Thus, active economic actors, including various financial companies, can have a positive impact on the development of the digital and platform economy through the development and implementation of various payment methods that would be not only efficient and secure, but also inexpensive. E-commerce allows you to conveniently and safely pay for purchased goods, works or services around the world. Working through digital platforms does not always guarantee a regular income, which is often not suitable for traditional lending models, which cuts off gig workers from bank credit.

The application and use of digital data will certainly increase credit scoring, open access to lending to "undervalued" entrepreneurs. For example, more than 55 % of them have replaced the traditional bank loan with a loan from fintech companies. Currently, of course, it is necessary to support digital methods that would contribute to improving the digital identification of users, as well as cloud technologies themselves [2].

2. Transition stage.

The use of artificial intelligence technologies, perhaps, will not surprise anyone. For the financial sector, this makes it possible to reduce the cost of services provided, increase reliability, increase the speed of their provision, and also ensure the necessary level of efficiency. Using the example of China, it can be noted that thanks to the use of artificial intelligence, the productivity of the financial system is projected to increase by 40 % in the next 10 years, which is equivalent to a reduction in working hours by almost 30 %, which will also be positively reflected in the entire economic system of the country [3].

It is worth paying special attention to the integration of emerging markets, since over the past 20 years the share of developing countries in the global economy has increased from 15 % to 30 %. If we consider global trade, then there was an increase from 1/5 to 1/3. Despite the positive aspects of market integration, such as increasing market size, healthy competition, providing better trading conditions, improving infrastructure or spreading the latest advanced technologies, many of them remain quite closed to foreign investment [3]. The transition to a green (low-carbon) economy can create significant opportunities for economic development. Nevertheless, many lenders, investors and insurers do not yet have a specific, clear and comprehensive idea of which companies and by which methods they will adapt to the new rules, technologies and changes in customer preferences, and therefore certain risks arise. The transition to a new economy with low carbon emissions requires significant investments – the world will need about 100 trillion. In the next 10 years, in order to create the appropriate infrastructure.

Demographic changes have a tremendous impact on the entire economic system. Thanks to advanced medical technologies, people live longer, and as a result, morbidity and disability are increasing. The reduction in the share of the able-bodied population puts a serious burden on the financing of pensions. Using the example of the UK, it can be traced that by 2030 it is expected that every fifth resident will be over 65 years old, and by 2040-2050 – every fourth, while about a third of the adult population does not have pension savings. The growth of employment in the gig economy has recently been associated with the fact that some social programs are missing or have been at the stage of completion for a long time [4].

Thus, thanks to the use of artificial intelligence, it is planned to reduce fraud cases, and financial services will become more accessible to many categories of citizens. At the same time, there are some difficulties that are inherent exclusively in this stage: economic entities must identify ways that will eliminate "artificial stupidity", that is, errors that are caused by an incomplete set of data; or how to designate responsibility for the loss of personal data and how to find ways to restore

them; designing the protection of artificial intelligence systems from manipulation; maintaining control over it, etc.

The gradual transition to a low-carbon economy will require support from the financial sector in order to ensure the mobilization of private financing for projects related to the reduction of carbon emissions. For example, it may be the issuance of "green bonds" or any other relevant and effective instruments. In order to ensure the implementation of these breakthrough technologies, it is necessary to improve the quality of information in which investors are interested in the conception.

In order to systematically support the demographic transition, it is necessary to expand the set of tools that allow the population to competently form and invest savings. Attention should be paid to the development of certain investment/savings products available to the public that could protect people even after retirement.

3. Stability check.

The spread of new business models in the financial market will contribute to the activity of the non-banking sector, since in addition to large technology companies and enterprises, small but quite promising start-ups also operate on it. On the one hand, we can talk about increased competition, but on the other hand, there is a threat to ensure stability for all global finances. The threat of cyber attacks, unfortunately, has become commonplace for the economy, including for the financial system. In 2020 alone, cybercrimes cost the world more than $500 billion. However, the volume of insurance premiums covered less than 1 % of the damage [5]. In modern realities, new, prompt, flexible and timely regulation is needed: the Basel Committee on Banking Supervision published twice as many regulatory documents, standards and forms in 2009-2017 than in the previous 20 years. This was caused by post-crisis regulatory reforms [5].

An important role is assigned to improving technological efficiency, since it is the use of advanced technologies in the activity and ensuring uninterrupted availability of data that can make economic entities more flexible, dynamic, helping to create new products and services that would meet customer expectations. As is known, the use of machine learning can increase the efficiency of an enterprise by up to 20 %.

Thus, innovations and regulatory innovations can solve a number of problems, but they can also lead to the creation of new risks or the appearance of old ones, but in newer, modern forms. In the field of cybersecurity, due attention should be paid to ways to recover lost data. Perhaps in the near future, a single cyber insurance market will be created to help enterprises manage risks. In terms of regulation, it should be noted that it should be adequate to the existing risks: outdated rules should either be abolished or radically rethought.

Thus, we can conclude: in order to increase technological efficiency, it is possible to create a central repository of all (or most of) statistical and regulatory reports with the ability to analyze in real time and upload certain details (including microdata). This will help to ensure transparency in the conduct of any data request and ensure that the costs required for their processing by companies are reduced. With a perspective of 10-15 years, regulators need to focus on independent data collection, refuse to request reports from companies in the real sector of the economy, which will contribute to more detailed and comprehensive processing, systematization and analysis of the information received.

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DIETARY SUPPLEMENTS AS A MASS CONSUMER FRAUD

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Abstract. This article takes a sceptical look at the reasons for the popularity of dietary supplements and the dangers associated with their use, trying to answer the question: can these substances really help get rid of any health problems, or is their marketing a great consumer fraud?

Keywords: dietary supplements, medicines, drugs, pharmacology.

БИОЛОГИЧЕСКИ АКТИВНЫЕ ДОБАВКИ КАК МАССОВЫЙ ОБМАН ПОКУПАТЕЛЕЙ

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Аннотация. В данной статье со скептической точки зрения рассматриваются причины популярности БАДов и связанные с их употреблением риски, пытаясь ответить на вопрос: действительно ли эти вещества могут помочь избавиться от любых проблем со здоровьем или же их маркетинг является большим обманом покупателей?

Ключевые слова: биологически активные добавки, БАД, лекарства, фармакология.

Dietary complexes with vitamins C, E, and K, St. John’s wort, garlic, and ginkgo – today one can see plenty of products with those and many other substances and herbs on the grocery and drug store shelves, that claim to be significantly beneficial for the receiver’s health. They are called biologically active dietary supplements (BADS) and you will easily find such a compound for any kind of health condition, be it a severe

decease or a minor dysfunction. At first glance they seem to be a great option to improve one's health, however not all about them is as clear as the advertisement is trying to present, and a further inspection may uncover the undesirable truth about the dangers that a regular intake of dietary supplements can pose. An example of a package design with dietary supplements is shown in figure 1.



Figure 1. A package design with dietary supplements

To begin with, let's look at the main reasons for the enduring popularity of dietary supplements. General public believes that dietary supplements are a natural and therefore a much safer alternative to synthetic drugs, that because such a natural way of treating health issues has been practiced since the earliest days of human civilisation, it must be undeniably effective. Some people even think that dietary supplements can be taken in an uncontrolled amount, and that their joint use with other drugs will not affect the effectiveness of the latter. However, all of the aforementioned arguments are grave misconceptions that lead to a great number of casualties each year [1].

First of all, dietary supplements are digestives, they are not medicines. They are used as an additional source of biologically active substances (nutrients, vitamins, minerals, amino acids) to reduce their deficiency and rationalise diet.

The distribution of BADS primarily has a commercial basis. Modern advertising of dietary supplements and medicines, especially on television, creates a high degree of risk for the consumer. The danger is also represented by those manufacturers who use unexplored or toxic natural components when creating BADS.

The sales of dietary supplements are high and they continue to grow. American statistics show that 75 % of US residents take BADS. Many people believe that supplements provide significant health benefits, and it is not surprising: this is the main message of their advertising. Cardiovascular disease is one of the leading causes of death, which is why supplements designed to "treat, alleviate, or prevent cardiovascular disease" are very popular. The problem is that BADS industry is largely unregulated, and claims of effectiveness are often not backed up by credible evidence: unlike a "normal" drug, a new dietary supplement can enter the market easily. This leads to

numerous reports of the unsafety of a number of supplements and suspicions that in some cases they can do more harm than good [2].

One of the biggest problems lies with the fact that many dietary supplements contain components whose presence is not indicated by the manufacturer, which can have a potent, often negative, effect on the human body. These include a number of near-narcotic and psychotropic substances that do not directly help solve the health problem that the drug is supposed to help cope with, but instead create the illusion of a successful treatment. So, for example, laxatives and diuretics are found in many dietary supplements for weight loss. With regular use, they are really able to reduce body weight, but this happens due to the release of incompletely digested food and liquid from the body, in volumes exceeding the norm. Thus, such dietary supplements can cause serious digestive disorders, nutritional deficiencies, prevent the release of toxins from the body, and also cause dehydration [3].

Besides, in order for the consumer to feel the benefits of the supplement and continue to spend money, undeclared ingredients may be added to it. For example, sildenafil (in other words, Viagra) can be included into BADS for erectile dysfunction, or additives enhancing the feeling of satiety can be put to the supplements for weight loss. “Harmless” muscle building supplements may contain synthetic anabolic steroids. In the US, this problem has already caused a lot of lawsuits [4].

Nevertheless, the presence of the active substance and its dosage are not indicated in the instructions, otherwise the drug is subject to registration as a medicine. This threatens with an overdose: daily intake of the same sildenafil will result in more serious problems than with potency.

In addition, a number of studies have shown that dietary supplements taken in conjunction with certified drugs can change their pharmacokinetics. Dietary supplements prevent the drugs from spreading properly inside the body, and the products of their use from getting out of it. As a result, the beneficial effect of drugs is greatly reduced and the risk of side effects increases. For instance, uncontrolled intake of BADS poses a great threat for people dealing with cancer: the products containing antioxidants lessen the effect of chemotherapy medicines, St. John’s wort makes general oncological medicines ineffective, while other are reported to cause extreme skin sensitivity which can lead to complications in case of radiation treatment [1]. St. John’s wort in specific also makes medicines for HIV/AIDS, heart disease, depression, treatments for organ transplants, and birth control pills seriously less effectual [5].

Despite all that, there are no standards for the production of dietary supplements. Their quality control consists only in assessing their safety as food products. Clinical trials of BADS are not conducted either. In Russia, there is no complete legal framework for the regulation in the field of dietary supplements turnover. As a result, dietary supplements have become the object of uncontrolled commercial activity with unscrupulous and aggressive advertising. Today, many dietary supplements are advertised as medicines, but in fact they are not. Commercial firms often produce BADS in an artisanal way. The interpretation of the term “dietary supplement” has

become ambiguous both among consumers and among medical personnel, this often leading to serious misconceptions and wrong actions [6].

There are more than 2,100 different supplements on the Russian market, and this is precisely the reason why doctors do not trust them – it is difficult to sort the wheat from the chaff in the absence of research. In the US, where the number of BADS reaches 80,000, the situation is even more alarming. The concentration of toxic impurities in a number of additives is sometimes off the scale. Every year, 20,000 ambulance calls are due to the poisoning with dietary supplements [7].

Thus, at present, dietary supplements are insufficiently studied. The amount of positive effect that they are able to provide is to be seen, all the while their negative impact can be detrimental in a number of cases. Therefore, many doctors prefer not to recommend them to patients as medication.

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ENVIRONMENTAL AND INDUSTRIAL SAFETY OF THE SYSTEM OF CIRCULATING WATER SUPPLY OF CAR WASHING

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Abstract. The article discusses the environmental problem of wastewater treatment at a car wash. An improved circulating water supply system is proposed in order to achieve a high cleaning effect and minimize the negative impact on the environment. Feasibility study of the attached scheme was carried out.

Keywords: circulating water supply, car wash, motor transport, electric floater, waste water treatment system.

ЭКОЛОГИЧЕСКАЯ И ПРОМЫШЛЕННАЯ БЕЗОПАСНОСТЬ СИСТЕМЫ ОБОРОТНОГО ВОДОСНАБЖЕНИЯ МОЙКИ АВТОТРАНСПОРТА

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Аннотация. В статье рассмотрена экологическая проблема очистки сточных вод на автомойке. Предложена улучшенная система оборотного водоснабжения с целью достижения высокого эффекта очистки и минимизации негативного воздействия на окружающую среду. Произведено технико-экономическое обоснование приложенной схемы.

Ключевые слова: оборотное водоснабжение, автомойка, автотранспорт, электрофлотатор, система очистки сточных вод.

In order to prevent the removal of dirt to the ground from vehicles, car washing is provided, and therefore the number of car washes increases, which, according to regulatory documents, must be equipped with a circulating water supply system. Today, an urgent problem is the treatment of wastewater from car washing in order to reuse it in recycling systems. Wastewater from car washing accounts for 80-85 % of the volume of industrial wastewater of motor transport enterprises. The main

contaminants of such waters are suspended solids and petroleum products. The concentration of suspended solids depends on a large number of factors: the type of car, its size, the nature of the road surface, seasonal conditions, the composition of the soil in the area of operation, the frequency of washing of rolling stock and the type of washing used.

Each type of vehicle has its own numerical values for the number of washes per year, water consumption and suspended solids and petroleum products content [1]. So, for cars, the number of washes per year is 250; water consumption for washing 1 car 200 liters; waste water volume – 45 m^3; content of suspended solids before/after passage of the settling tank – 700/40 mg/m^3; content of petroleum products before/after passage of the settling tank – 75/15 mg/m^3. For trucks and buses, respectively, the number of washes per year is 200/90; water consumption for washing 1 car 800/350 liters; waste water volume – 144/28.35 m^3; content of suspended solids before/after passage of the settling tank – 2000/700, 1600/40 mg/m^3; content of petroleum products before/after passage of settling tank 900/20, 850/15 mg/m^3.

Process schemes for the treatment of car washes wastewater include various options for their implementation by structure, composition, and technical means. The complex is usually led by mechanical treatment facilities, physical-chemical and biological ochisky. The treatment system should be planned comprehensively, considering the production capacity, the amount of water resources used, the composition and concentrations of pollutants. Water quality shall be ensured for the following parameters: suspended solids – 3 mg/l; petroleum products – 10 mg/l; smell – 2 points; color – 10 cm; BOD – 3 mgO_2/l; COD – 30 mg O_2/l [2].

The principle of operation of the circulating water supply: wastewater and storm water (via rainwater receivers) flow by gravity to the storage tank, where the water is averaged and homogenized. The tank fluid level is monitored by a level sensor. From the tank, water is supplied by a pump to a two-section reactor, where coagulant (aluminum sulfate) is supplied from the dosing pump using a dosing pump. Mixing of waste water and coagulant takes place with the help of compressed air from the compressor. A membrane flotator is located below the reactor. Cleaning of the two-section reactor is provided by a diaphragm pump (operates on compressed air). The sludge is collected in a sludge collector. The membrane flotator receives effluents from the tank by gravity to extract surfactants, suspended solids and petroleum products. In the membrane flotator, due to the passage of air under pressure through porous ceramic membranes, water is saturated with air bubbles and floatation of dispersed systems. As a result, float sludge is piled on the surface of the water in the foam layer, which is removed by the foam collector into the sludge collector. Sludge is disposed of as it accumulates. From the membrane flotator, water flows by gravity into the storage tank, from where it enters the sorption coarse filter with a pump, where residual suspended matter is removed. The coarse filter is automatically flushed with a reverse current with the discharge of contamination into the tank. Then the water enters the tank, from where the pump is supplied to the car wash. From the storage tank, the excess water is pumped to the fine sorption filter, where the water is further purified to $MPC_{r.x}$. The

filter is automatically flushed with a reverse current with discharge into the tank. Purified water is used to flush the filters. After passing the filter, water under pressure is discharged to the relief or to the reservoir [3; 4]. Simplified wastewater treatment scheme in figure 1.

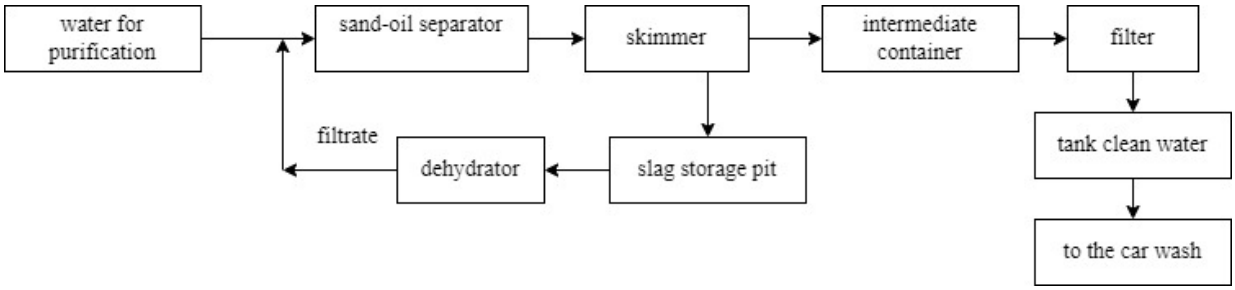


Figure 1. Simplified Waste Water Treatment Scheme

Existing schemes, methods and technologies for treatment of recycled water wastewater do not always meet the requirements and standards. The improvement of the scheme in figure 1 is proposed by replacing the flotator with an electrophlotator. The improvement of membrane and flotation technologies makes it possible to create equipment with minimal weight and dimensions, easy to install, with the possibility of increasing the efficiency of treatment facilities due to the modular design, minimal operating costs for consumables and electricity. Part of the circulating water supply treatment system will be an electrophlotation module (electrophlotator (capacity 10 m^3/h), insoluble electrode unit, foam collecting device and energy-saving power supply). Efficiency of extraction of suspended solids by the electrophlotator is 95-99 %; petroleum products – 70-90 %; surfactants – 70 %.

Advantages of electroflotation equipment: high efficiency of extraction of dispersed phase (up to 99 %); high efficiency of extraction of petroleum products and emulsions (up to 90 %); versatility. It efficiently extracts complex mixtures, for example, TM + oils + calcium, magnesium, iron cations + petroleum products; no secondary water contamination; no consumption of reagents and other replaceable materials (filters, sorbents, etc.); ease of operation, automatic mode of operation: floatsludge is less wet (94-96 %), 3-5 times easier to dehydrate.

Disadvantages: large electricity consumption; contamination of the surface of the electrodes; release of gas bubbles – H_2.

The process of electroflotation is energy-consuming, in addition, there is a possibility of the formation of an explosive mixture of oxygen with hydrogen. To solve these problems, there is an option of combining an electroflotator with a fuel cell, while hydrogen released during electroflotation is utilized in a fuel cell with the generation of electric energy. The fuel cell serves to generate electric energy during electrochemical oxidation of the fuel. The elements of the fuel cell are an anode (fuel oxidation), a cathode (oxidizer reduction) and an electrolyte. Electrons move along the outer chain, and ions through electrolite. The most efficient fuel cells are with solid electrolytes (polymer, solid oxide, proton-ceramic) [5].

During the operation of the electrophlotator, hydrogen and oxygen unreacted in the catalytic unit are released. Gases are supplied to fuel cell, and electrode connection of fuel cell is closed through electrodes of electrophlotator. The capacity of the electroflotator is 3 m^3/h (45 g/day of hydrogen), so the fuel cell with an area of 200-250 cm^2, 15 V voltage and efficiency 50 % will provide a power of 500 W, which is equivalent to the 55 % power of the electroflotator. Cooling water storage with a built-in float valve – volume of 1000 l, foam collector 200 l, network voltage 220 V, average electricity consumption 250 W/h, maximum power consumption 1,5 kW.

Thus, the energy efficiency of the electroflotator is increased and hydrogen is used. Table 1 presents the feasibility study for the introduction of this circulating water supply scheme.

Table 1 – Feasibility Study of Scheme Introduction

№	Expenses	Electroflotation cleaning
1	Effluent flow rate (3476 m^3/year)	Return of effluents to production
2	Payments for pollution of effluents discharged in the Vodokanal network	Use of closed-loop water without discharge to the sewerage system
3	Reagent consumption	Flocculant 1,738 kg/year
5	Categorization of effluents	Not required
6	Deposit	Foam product 94-96 % humidity
7	Cleaning efficiency	High (99,9 %)
8	Electricity (1080 kW/year)	20541,6 RUB/ year

Thus, studies in the field of the water treatment system have shown that this water use system provides favorable conditions for a car wash as a high effect, sufficient for the use of treated wastewater in the circulating system, as well as for discharge into the storm or sewage networks of the city, provided that the regulations for their operation are clearly observed. It must be remembered that treatment plants are the production of clean water, which means the creation of a favorable healthy environment for human life.

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TECHNOLOGICAL EFFICIENCY OF SHALE OIL PRODUCTION IN THE USA

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Abstract. Shale oil as the main energy resource of the USA is considered in this article. The development of this industry, the feasibility of using on an industrial scale are analyzed.

Keywords: shale, shale oil, oil shale, conventional oil, reserves, production, industry.

ТЕХНОЛОГИЧЕСКАЯ ЭФФЕКТИВНОСТЬ ДОБЫЧИ СЛАНЦЕВОЙ НЕФТИ В США

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Аннотация. В данной статье рассматривается сланцевая нефть как основной энергоресурс США. Проанализировано развитие данной отрасли, целесообразность использования в промышленных масштабах.

Ключевые слова: сланцы, сланцевая нефть, горючие сланцы, традиционная нефть, запасы, добыча, промышленность.

At present, the rapid development of human civilization is taking place, new technologies are being mastered, and equipment is being improved. The development of the technical sphere is taking place at a high pace, as a result of which the demand for natural resources increases. One of the main energy resources in the modern world is the type of “black” fuel – shale oil.

Shale oil is a raw material that has become actively promoted at the present time. It involves the processing of oil shale through their dissolution and subsequent transformation of hard rocks into synthetic hydrocarbons [1].

Oil shale is a mineral from the group of solid caustobolites, which, during dry distillation, gives a significant amount of resin (similar in composition to oil). Shales were mainly formed 450 million years ago at the bottom of the sea from plant and animal remains. During combustion, oil shale emits heat, and during thermal decomposition, shale oil (this product is an analogue of heavy oil and is used as a fuel instead of fuel oil), combustible gases and tar water. Both processes are accompanied by the formation of ash [2].

The first data on the produced shale oil date back to 1821, but the technologies for commercial production of such oil appeared only in the 80-90s of the last century.

The idea of how to extract oil from deep shale is attributed to the American oil industrialist George Mitchell, who combined 2 methods of extraction:

1) horizontal drilling – the goal is to drill a well to oil shale, and after the well is drilled, its direction changes to horizontal, deep into the reservoir;

2) hydraulic fracturing – a special solution is pumped into the well under pressure, which consists of industrial water, as well as granular quartz sand, breaking the reservoir. In this case, many cracks are formed, and then oil can penetrate through these cracks into the reservoir, from where it can be pumped out through the well [3].

There is a difference between conventional oil and oil recovered from low permeability reservoirs. Firstly, in terms of the quality of the final product, i. e. “commercial” oil, they do not differ significantly in any characteristics. It turns out that the goods are identical, but the processing procedure itself is different.

Secondly, their main difference is in the method of extraction. Shale has a different density and requires a completely different technology to work with the deposit (more on this in the following sections). The layers can be clearly seen on the example of the location of shale formations (Figure 1).

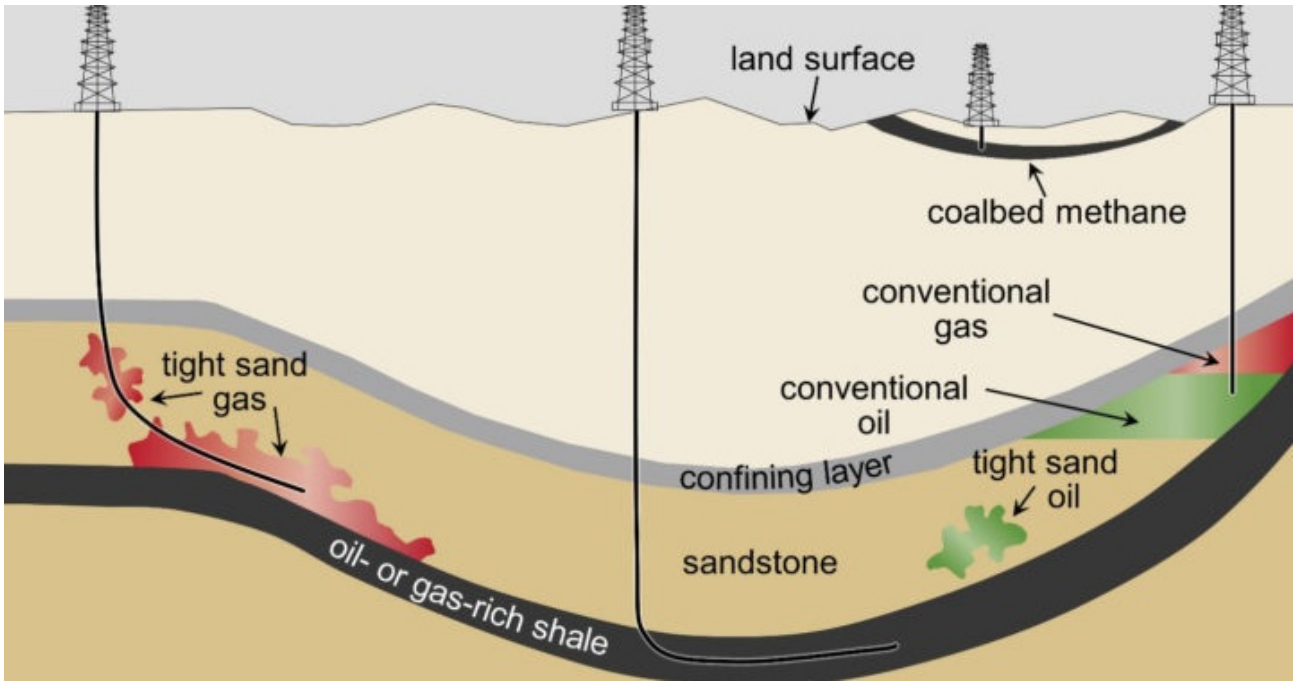


Figure 1. An example of the location of shale formations

Thirdly, we can distinguish a diverse position in the following areas:

1. Cost per barrel – it is more difficult and expensive to produce shale, as a result, the cost per barrel is higher than that of traditional;

2. Environmental safety – when mining by hydraulic fracturing, chemical contamination of groundwater and soil occurs.

Fourth, the final difference is the available shale oil reserves. According to some experts, they amount to 3 trillion. barrels worldwide against 1.3 trillion. barrels of conventional oil, but it should be borne in mind that conventional oil reserves are depleted quite quickly [4].

At the moment, there are two types of shale oil known in the world: “tight oil” and “shale oil”. The first type is traditional light fraction oil, which occurs in low-permeability reservoirs. The second type includes kerogens occurring in shale rock. Shale oil is a high-viscosity shale resin that differs significantly in density and viscosity from traditional oil. Obtained from oil shale after thermal exposure. They are formed from the remains of plants, living organisms and, in essence, are the initial form of oil [5].

At the beginning of the history of the American oil industry, there was only one oil region – the State of Pennsylvania, where the first oil was produced. Question: "How many years will the United States oil reserves last?" stood up very sharply in 1885. In light of declining reserves of traditional minerals, the high cost of oil, and the USA desire for energy self-sufficiency, it was necessary to develop a new technology to extract oil from shale rocks, which led to a rapid increase in production [6].

There are several factors that explain why the USA began to produce shale oil on an industrial scale:

1. Technological innovation would not be possible without long-term public funding. The President of the United States, in his State of the Union address on January 24, 2012, said that “it was the state funding of scientific research, which lasted for more than 30 years, that helped the development of technologies for extracting gas from shale rocks, reminding us that state support is vital to help business in extraction of subsoil energy through the implementation of new energy ideas”;

2. The USA was able to transform the historical "cons" of the development of its oil industry into its modern "pluses", which ensured the rapid and widespread development of shale hydrocarbons. As a result, 85 % of the total number of production wells in the world are concentrated in the United States, most of which are marginal and operate in a non-permanent mode. But it also served as a powerful stimulus for the development of a highly efficient and widely diversified service industry adequate in terms of well stock and aimed at reducing costs, which makes the cost of wells in the USA 60-80 % cheaper than in other countries;

3. A system of subsoil use, in accordance with which, on land in the United States, the right to use subsoil belongs to landowners. Since it is they, and not the state, as in other countries, who receive lease payments and fees for the right to use subsoil, this encourages private owners of land plots to lease them to subsoil users. But this also encourages subsoil users to quickly develop the obtained subsoil plots, since license

agreements usually provide for an intensive work program, failure to comply with which leads to the termination of the lease;

4. Tax and investment incentives and other intensive measures of direct state support for private business (if a country aims to achieve energy independence or another no less ambitious task, which is based on huge investments, then this is done in an alliance, and not in a confrontation between the state and private business) [7].

The development of shale oil production turned out to be not just a technological order, but a unique combination of new technologies, geology, economics and business climate. This made it possible to radically change the "landscape" of oil and gas production in the USA, but did not lead to similar transformations in the oil and gas industries of other countries. Let's start with the fact that rocks that contain hard-to-recover oil and gas are located in the United States at a shallow depth and have a significant productive thickness. It is this factor that determines the production of shale oil. For example, the well-known Bakken formation, located in the state of North Dakota, with the development of which the development of shale oil in the USA actually started, lies at a depth of 2.5-3.5 thousand meters. The Permian Basin in Texas, which today produces most of the shale production, is located even closer to the surface, at depths of less than 3 thousand meters [8].

Statistics say that the Americans have a fairly impressive number of shale deposits, among them it is worth highlighting:

− Eagle Ford – in the state of Texas, the reserve is 335 million tons, 6 oil companies operate;

− Bakken – in North Dakota, the reserve is 733 million tons, 20 oil companies operate;

− Woodford – on the border of Arkansas, the reserve is 54 million tons, 8 companies operate;

− Avalon & Bone Springs – on the border of Texas, the reserve is 217 million tons, 6 companies operate;

− Monterey/Santos – in California, 5 companies operate [4].

The main consequences of the growth of the United States shale industry can be identified:

1. The reserves of shale oil on the planet are estimated at more than 20 trillion tons, which is many times greater than the reserves of traditional oil.

2. Shale oil is a promising resource for further growth of the United States fuel and energy complex. To date, the entire industry and the economy of the country are aimed at the development of this industry.

3. The extraction of shale oil has a relatively low labor intensity, since shale occurs at relatively shallow depths.

4. Various types of products can be obtained from oil shale: fuel and energy (gas, heating oil, diesel, heating oil, gasoline, kerosene); chemical (benzene, toluene, thiophene, sulfur, phenols, ichthyol, etc.), concentrates of rare and trace elements. All shale processing products can be used in industry, for example, for lighting, heating, building materials [9].

Considering all the nuances, the territorial component, the impact on the economy, it can be concluded that the USA is actively using such an energy resource as shale oil and has serious prospects in this industry. Investments in this industry seriously strengthen the role of the United States in the global oil market – if desired, production volumes can be sharply increased and any deficit in the market can be closed.

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ASSESSMENT OF THE NEED TO REDUCE EMISSIONS FROM STATIONARY SOURCES DURING ADVERSE METEOROLOGICAL CONDITIONS

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Abstract. When receiving forecasts of unfavorable meteorological conditions, users of natural resources for sources of emissions of pollutants into the atmospheric air are obliged to take measures to reduce emissions of pollutants into the atmospheric air. These requirements must be met at all objects with a negative impact on the environment that have emissions into the atmospheric air, with the exception of objects of category IV. The article presents the results of calculations under the most unfavorable conditions for the Branch of JSC "Tatenergo" – Nizhnekamsk HPP, which established that the maximum surface concentrations of pollutants do not exceed the values. On the basis of the calculations carried out, a conclusion was made about the inexpediency of measures to reduce emissions. Proposals are made on the procedure for concretizing the list of enterprises for organizing work to reduce emissions under adverse meteorological conditions, using a system of consolidated calculations.

Keywords: adverse weather conditions, air pollution, emission reduction, measures.

ОЦЕНКА НЕОБХОДИМОСТИ СОКРАЩЕНИЯ ВЫБРОСОВ ОТ СТАЦИОНАРНЫХ ИСТОЧНИКОВ В ПЕРИОД НЕБЛАГОПРИЯТНЫХ МЕТЕОРОЛОГИЧЕСКИХ УСЛОВИЙ

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Аннотация. При получении прогнозов неблагоприятных метеорологических условий природопользователи для источников выбросов загрязняющих веществ в атмосферный воздух обязаны проводить мероприятия по уменьшению выбросов загрязняющих веществ в атмосферный воздух. Указанные требования должны выполняться на всех объектах негативного воздействия на окружающую среду, имеющих выбросы в атмосферный воздух,

за исключением объектов IV категории. В статье приведены результаты расчетов при самых неблагоприятных условиях для филиала АО «Татэнерго» – Нижнекамская ГЭС, которыми установлено непревышение максимальными приземными концентрациями загрязняющих веществ значений. На основании проведенных расчетов сделан вывод о нецелесообразности мероприятий по сокращению выбросов. Вносятся предложения по порядку конкретизации перечня предприятий для организации работ по снижению выбросов при неблагоприятных метеорологических условиях с использованием системы сводных расчетов.

Ключевые слова: неблагоприятные метеорологические условия, загрязнение воздуха, снижение выбросов, мероприятия.

During periods of unfavorable meteorological conditions (NMC), the probability of a critical increase in surface concentrations of impurities increases. Strictly speaking, NMUs can be determined individually for each source, depending on its parameters, and, accordingly, differ from each other. But there are also meteorological conditions that make it difficult to disperse impurities coming from all types of sources. These include calm, temperature inversion, fog, smog, and combinations of these factors. When such NMC phenomena occur, the degree of atmospheric air pollution can increase even with a constant volume of emissions [1; 2; 3; 4].

In order to reduce the growth of impurity concentrations during periods of NMP, the regulation of emissions of harmful substances into the atmosphere is carried out, which consists in their short-term reduction. Emissions are regulated taking into account the forecast of NMU based on warnings about a possible dangerous increase in concentrations of impurities in the air in order to prevent it. Depending on the expected level of air pollution, warnings of 3 degrees are drawn up. Warnings about NMC of the 1st degree of danger are formed when an increase in surface concentrations of pollutants is expected up to 20 %, 2nd degree – up to 40 %, 3rd degree – up to 60 %.

When developing measures for short-term reduction of emissions during periods of adverse weather conditions, the following should be taken into account:

1) measures should be sufficiently effective and practically feasible;

2) measures should take into account the specifics of specific industries;

3) the implementation of the developed measures, if possible, should not be accompanied by a reduction in production [5].

The development of measures to reduce emissions during NMU or justification of the absence of the need for such measures should be carried out at all enterprises operating sources of pollutant emissions, with the exception of objects of category IV, determined in accordance with [6]. However, the measures currently being taken do not lead to the necessary reduction in the level of atmospheric pollution during the periods of formation of NMOs [7]. To ensure adequate air quality, it is necessary to strengthen and concentrate measures aimed at reducing emissions from NMC for a

limited circle of the most significant enterprises. In our work, the calculations of the emission reduction efficiency at NMU were carried out for stationary sources of emissions from the Nizhnekamsk HPP, a branch of JSC "Tatenergo". Calculations of the dispersion of harmful substances in the atmosphere using the UPRZA Ecolog program, version 4.60, developed by the Integral company (St. Petersburg) and recommended by the GGO named after. Voeikov to substantiate the MPE standards. The program allows you to determine the concentration of harmful substances in any node of the calculation rectangles (with any step defined by the user) for each ingredient under conditions that the computer selects by enumeration of wind directions and speeds and selecting the most dangerous ones with a step of 0.1 m/s. Wind direction enumeration step – 1 °C.

Calculations were carried out for all emitted substances and summation groups at an ambient air temperature equal to the average maximum outdoor air temperature of the hottest month of the year (summer period), as the period of the least favorable dispersion conditions.

The results of calculations (local concentration maxima) are shown using the example of the pollutant xylene (0616) in the form of a map-scheme of dispersion in the surface layer of the atmosphere in fractions of MACm.r. (Figure 1).

Calculations of concentrations and dispersion of emissions of harmful substances in the surface layer of the atmosphere without taking into account background pollution from stationary sources of emissions of the industrial site of the Branch of JSC "Tatenergo" – Nizhnekamsk HPP showed that the condition qm.pr.j> 0.1 is fulfilled outside the boundaries of the land plots of the facility for sulfuric acid , dimethylbenzene, methylbenzene, butyl acetate, epoxyethane, mineral oil, abrasive dust, wood dust.

Dispersion calculations without taking into account background pollution also showed that under the most unfavorable conditions (simultaneous operation of all pollutant emission sources, hazardous wind speeds and directions), the maximum surface concentrations of pollutants do not exceed 1 MPC at the border of the SPZ, the territory of multi-apartment residential development and 0.8 MPC at the border of gardening associations for all substances and their summations.

Due to the fact that for the pollutants for which maximum allowable emissions are being developed, MPE standards are set for the current situation, no measures to reduce emissions are envisaged.

At the same time, determination of the level of chemical air pollution created by one object under consideration without taking into account background pollution can lead to an underestimation of the results of assessing the significance of the object.



Figure 1. Isolines of dispersion of pollutants (industrial site No. 1 Main). Calculation code: 0616 (Dimethylbenzene (mixture of o-, m-, p-isomers) (Methyltoluene)). Parameter: Concentration of a harmful substance (in fractions of MPC)

Taking into account the current legislation, in order to determine the need to reduce emissions at NMU, they are guided by the provisions [5], according to which the development and coordination of emission reduction plans is carried out for any objects of categories I-III [6]. Assignment to a particular category is based on the activities carried out at the facility, and reflects the impact on the environment as a whole. An analysis of the state register of objects of negative impact shows that many objects classified as hazard category III have only minor emissions into the air (recreation centers, sports facilities, kindergartens, etc.).

It should also be noted that as part of the state monitoring of air pollution, air quality violations are regularly recorded, a significant part of which occurs during periods of NMU [8].

In connection with the above, it should be noted the earlier version of the Decree of the Cabinet of Ministers of the Republic of Tatarstan dated May 22, 2012 No. 407 “On the organization of work to regulate emissions of harmful (pollutant) substances into the air during periods of adverse meteorological conditions in the Republic of Tatarstan” (before entry into force of changes in accordance with the Decree of the Cabinet of Ministers of the Republic of Tajikistan dated January 21, 2021 No. 18), which limited the list of enterprises submitting emission reduction plans under NMU for consideration by the authorized body of the subject. With such an organization, a set of works to ensure the reduction of the negative impact of NMU focuses on a limited list of the most significant enterprises.

Thus, in order to increase the efficiency of the work of state environmental authorities, it is necessary to develop a procedure for concretizing the list of enterprises for organizing work to reduce emissions from NMU and updating it over time.

The procedure for determining the significance of enterprises should ensure the objectivity and complexity of information on the maximum levels of impact of objects, be in accordance with regulatory requirements, and the availability of initial information for its implementation should also be ensured.

The most appropriate tool for these purposes, which meets all the necessary requirements, is the system of consolidated calculations, the use of which is fixed as the main mechanism for implementing state policy in the field of ensuring environmental safety in relation to the protection of atmospheric air by Decree of the President of the Russian Federation No. 176 dated April 19, 2017 "On the Strategy for Environmental security of the Russian Federation for the period up to 2025”.

Summary calculations make it possible to consider the concentrations of pollutants directly formed by the object's emissions, as well as the characteristics of their distribution as parameters characterizing the possible degree of negative impact, as parameters characterizing the possible degree of negative impact. It is obvious that the degree of danger of an object should increase with an increase in its contribution to the pollution levels of a residential area, the size of the zone of influence, the number of emission sources of the object that can create high concentrations in a residential area, and the scale of the object itself.

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COMPARATIVE ANALYSIS OF DOMESTIC ASYNCHRONOUS ELECTRIC MOTORS

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Abstract. This article presents a comparative analysis of asynchronous electric motors of domestic manufacturers in order to determine the most suitable for use in production.

Keywords: asynchronous electric motor, electrical equipment, electric power, comparison, electric motor, production, benefit, manufacturers.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ОТЕЧЕСТВЕННЫХ АСИНХРОННЫХ ЭЛЕКТРОДВИГАТЕЛЕЙ

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Аннотация. В данной статье приведен сравнительный анализ асинхронных электродвигателей отечественных производителей с целью определения наиболее подходящего для использования на производстве.

Ключевые слова: асинхронный электродвигатель, электрооборудование, электроэнергия, сравнение, электродвигатель, производство, выгода, производители.

At the present time, domestic electrical equipment is ideal for connecting the interests of Russian consumers with a domestic manufacturer. There are no problems with delivery, the price and quality of Russian equipment put imported equipment out of competition. In addition, it can be noted that there are detailed technical instructions, device connection diagrams and quick advice from the technical support service. All this contributes to solving any problem that has arisen both at enterprises and among ordinary citizens who use domestic electrical equipment. This review provides a comparison of domestic firms regarding the acquisition of asynchronous electric motors.

Among the devices that convert electrical energy into mechanical energy, the undisputed leader is a three-phase asynchronous motor – a very reliable and easy-to-use unit. Due to its qualities, it has been widely used in industrial enterprises and other areas where such mechanisms are used. The name of the engine is directly related to the peculiarity of its work. In these devices, the stator magnetic field rotates at a frequency exceeding the rotor speed. The unit is powered by AC power. This review provides a comparison of domestic firms regarding the acquisition of asynchronous electric motors.

An asynchronous electric motor (AEM) is an electric motor of continuous current, the rotation frequency of the rotor of which is not equal to the rotation frequency of the magnetic field produced by the current of the stator winding. [1]. It is also commonly called an induction motor. This is due to the fact that the current in the rotor winding is induced (an electric current arises by changing the magnetic field) by the rotating field of the stator. Induction motors today make up the majority of electric machines and are the main converters of electrical energy into mechanical energy.

At this stage of technology development, the use of AEM, both in household and industrial electrical equipment, makes it easy to convert electrical energy into mechanical energy [2].

AE are used in absolutely any field: heavy and light industry, medical equipment, water supply and ventilation systems, etc.

Asynchronous motors are very widely used in various sectors of the economy and production due to their simplicity, their manufacture and high reliability. Meanwhile, four main types of asynchronous motors can be distinguished [3].

− single-phase AEM with a short-circuited rotor;
− two-phase AEM with a short-circuited rotor;
− three-phase AEM with a short-circuited rotor;
− three-phase AEM with a phase rotor.

To date, there are a very large number of electric motors that are different in structure and control method. However, in review, AEM with a short-circuited rotor will be considered. (Figure 1).

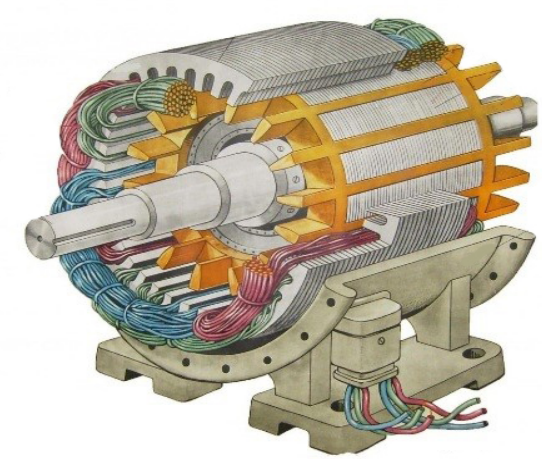


Figure 1. Asynchronous electric motor with a short-circuited rotor. Inside view

Let's consider both the positive sides of the motor with a short-circuited rotor and the negative sides:

The advantages include: approximately constant rotation speed at different loads; the possibility of short-term mechanical overloads; simplicity of design; simplicity of direct start, the most common method of starting asynchronous motors, but not devoid of disadvantages such as a large starting current and a relatively small starting torque. Therefore, direct start is used for small and medium-power engines. Ease of AE automation, primarily due to the use of frequency converters and soft-start devices, as well as higher efficiency than that of phase rotor motors.

Disadvantages: low slip coefficient, high starting currents, sensitivity to voltage drops, the need for switching control devices.

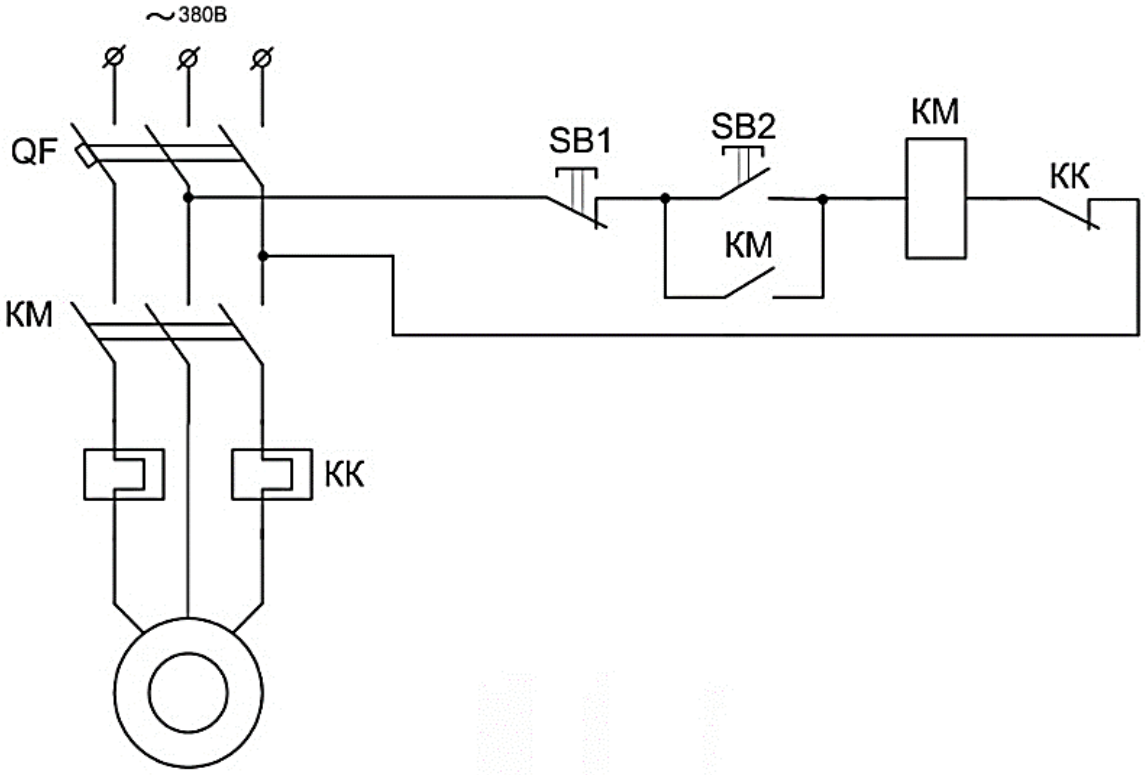


Figure 2. Circuit diagram of an asynchronous electric motor with a short-circuited rotor

As a comparison, three domestic manufacturers of AEM were selected, such as: «Vemper», «Elmash» and «UESC» [4]. The selected companies are the leaders of the Russian market of various types of electrical equipment, which means that they have a certain number of users, according to whose reviews a conclusion will be made about the quality of their equipment. A comparative analysis is carried out according to the efficiency of each of the electric motors and the pricing policy.

Efficiency is determined in an electric motor by the fact that when converting one type of energy into another, part of the energy is lost in the form of heat dissipated in its various parts. There are three types of energy losses in electric motors: losses in windings, losses in steel and mechanical losses. In addition, there are minor additional

losses. An AEM is designed so that its maximum efficiency takes place at a load slightly less than the nominal one. The efficiency of the engine is quite high and in a wide range of loads. For most modern AEM, the efficiency is 80-90 %, and for high-power motors – 90-96 %. [5]

The company "Vemper" – the products of this trademark are manufactured at leading factories in Russia and China [6]. The products meet all the requirements of modern Russian GOST standards and comply with current international technical standards and regulations. The company's motto is "VEMPER – the most necessary, in – demand and time-tested models of engineering and industrial equipment!". Looking through the reviews of their products, it was not possible to find unsatisfactory ones.

The company "Elmash" – JSC "Voronezh Electromechanical Plant" is a Russian manufacturer of electric motors, electric generators, transformers, fans, hydraulic and pneumatic power equipment [7]. The manufactured equipment has high reliability and long service life. The company specializes in the supply of electric motors and drive equipment. Regarding comments and reviews about this company, everything is as positive as with the company "Vemper".

The company "UESC" – The profile of the activity of this company is the sale of asynchronous three-phase and single-phase electric motors, as well as product improvements at the request of customers, for example, the installation of electromagnetic brakes on electric motors and rectifiers [8]. Since 2007, it has more than 5,000 satisfied customers and the geography of equipment supplies throughout the Russian Federation. The company's motto is "The fastest solution to any problem with minimal time". There are also no negative reviews about this company, which suggests that the products of this company did not let users down.

Electric motors with one rated power (250 kW) were selected to compile a comparative analysis AIR 355MB6, where:

− AIR – asynchronous electric motor.
− 355 – dimensions.
− MB – the installation size along the length of the frame.
− 6 – the number of poles.

Detailed technical specifications are presented in Table 1.

Table 1 – Comparative characteristics of AEM

Specifications	*Vemper*	*Elmash*	*UESC*
Price, p	750 706	1 120 248	990 754
Rated current, A	456	457	456
Supply voltage, V	380	380/660	380/660
Degree of protection	IP55	IP55	IP55
Efficiency, %	95.2	94.9	95

Based on the collected information, which is presented in a simplified form in Table No. 1, it can be noted that the asynchronous electric motor from Elmash is noticeably more expensive than its competitors. In addition to this, it has a lower efficiency score. The rated current, degree of protection and voltage are the same as those of the electric motors considered in this article.

The asynchronous electric motor from the company Vemper has a much more attractive cost, relative to the engine from the manufacturer Elmash, however, it can only be used from a 380 V network, when the rest can operate from both 380 V and 660 V. However, this electric motor has the highest efficiency (95.2 %).

The asynchronous electric motor from the company "UESC" ranks second in this comparison in terms of price and efficiency. Other characteristics are slightly different from competitors.

When choosing an asynchronous electric motor from the options presented, the following can be recommended. Of the above options, Vesper is a clear favorite. It is noticeably cheaper; the efficiency indicator is higher than that of competitors. Regarding the other characteristics, we can say that they are the same. Judging by the user reviews of Vamper products, there are no complaints here, which indicates the good quality of the products of this manufacturer.

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THE USE OF PERSONALIZATION ELEMENTS IN AN E-LEARNING COURSE IN A FOREIGN LANGUAGE

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Abstract. The potential of introducing elements of personalization in an electronic educational course of a foreign language in a blended learning format on the basis of Moodle has been considered. Personalization allows educators to adapt the educational process to the individual characteristics of students, helps to increase their internal motivation, satisfaction with academic performance, the development of educational autonomy, optimization of the educational process through careful selection of priority points in the course content, which ultimately ensures the effective formation of foreign language competencies.

Keywords: personalized learning, foreign language teaching, electronic educational content, self-study, blended learning.

ИСПОЛЬЗОВАНИЕ ЭЛЕМЕНТОВ ПЕРСОНАЛИЗАЦИИ В ЭЛЕКТРОННОМ УЧЕБНОМ КУРСЕ ПО ИНОСТРАННОМУ ЯЗЫКУ

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Аннотация. Рассмотрены возможности использования элементов персонализации в электронном образовательном курсе иностранного языка в смешанном формате обучения на базе системы управления обучением Moodle. Персонализация позволяет адаптировать учебный процесс к индивидуальным характеристикам обучающихся, способствует повышению их внутренней мотивации, удовлетворенности успеваемостью, развитию учебной автономности, оптимизации учебного процесса за счет тщательного отбора приоритетных «узлов» в контенте курса, что в итоге обеспечивает эффективное формирование иноязычной компетенции.

Ключевые слова: персонализированное образование, преподавание иностранного языка, электронный образовательный контент, самостоятельная работа, смешанный формат.

In the context of the accelerated digital transformation of education, personalization has become a steady trend in the development of educational programs around the world in a wide variety of disciplines. Today, personalized learning is seen by experts as an alternative to the impersonal, standardized universal approach.

Personalization is sometimes also seen as the “core” of the digital transformation of education in Russia [1].

Mironenkova N. N. et al. consider personalization of an individual serves as a continuation of their being, expresses individual representation, their own otherness in other people, in other words, it is the transformation of a subject into a person who has found their own individuality, own personal meaning.

Educational activity, driven by personal meaning, takes the form of internal motivation, which subsequently affects the quality of education [2].

According to R. DeLorenzo, personalized education is a vector for the development of the education worldwide [3].

In the works of foreign researchers, several terms, such as individualized instruction, adaptive learning, customized learning, and personalized learning are used in parallel to designate student-centered approaches to learning [4; 5].

The collision of terms that are obviously related but have distinct differences certainly contributes to the confusion and ongoing debate about the pedagogical potential of personalized learning.

So, among scientists, there is no consensus on whether individualization is an element of personalized learning, its derivative, or whether these terms are interchangeable.

According to the definition, provided by a specialized glossary, the term personalized learning, or personalization, refers to a diverse variety of educational programs, learning experiences, instructional approaches, and academic support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students [6].

In Russia in 1995 A. G. Solonina introduced the term “personalized learning” into the academic discourse and, on the basis of the theory of personalization, put forward by V. A. Petrovsky [7], developed the concept of personalized learning for higher education. According to A. G. Solonina, personalized learning is learning which allows fulfilling the need of each participant in the educational process to be a person, as well as to personalize learners and educators both in the community of learners and in the community of educators, mutually enriching these communities and the people who form them [8].

However, it is worth paying attention to the works of researchers who highlight the negative aspects of personalized learning. Thus, experts emphasize the fact that personalized and adaptive learning can substantially reduce student learning stress, which, unfortunately, reduces the need for students to learn and cope with stress.

Moreover, personalized learning, in theory, deprives students of a competitive environment and creates the illusion of absolute success. In a comfortable environment, the students neither experience failure nor gain experience in overcoming the challenges of the realities of life.

An important factor in evaluating the efficiency of personalized learning is also the need for a massive investment of teachers' time and hence the funds of educational institutions.

In the field of teaching a foreign language, the influence of personalization has acquired particular relevance in the context of the advance of the communicative

approach as the dominant and most effective at present. The basis of the communicative approach is student-centered instruction, the increase of all types of student motivation. Language learning takes place in a situation of significant communicative activity for language learners, with personal meanings and goals, real information about oneself and one's activities, along with an awareness of responsibility for a student's own progress.

The study of a foreign language contributes to the development of students' memory, thinking, imagination, and attention, as well as such special abilities that are required to implement the process of foreign language communication. This is primarily phonemic and pitches hearing, imitative abilities, and the ability to distinguish and guess.

It is also important to note that, in most cases, teaching a foreign language in a non-linguistic university takes place in conditions where students in the same academic group have significantly different starting levels of foreign language training, as well as different levels of motivation for learning a foreign language. A teacher implementing a syllabus faces the difficult task of creating optimal conditions for an effective educational process, involving all students, and ensuring the development of their communicative competencies within the strict framework of the current syllabus requirements.

The key factor that ensures the effectiveness of this learning process is the constant maintenance of an adequate level of motivation among students to master a foreign language as a means of professional and personal development.

Personalization of learning enables teachers to analyze the needs and goals of each student. On this basis, the teachers are able to create conditions for the realization of each student's potential. The development of educational technologies, such as LMS, allows educators to find new solutions to the problem of personalization in teaching a foreign language.

One of the promising areas for the development of blended learning in a foreign language, in particular, is the integration of personalization elements into electronic educational content.

In the current syllabus, the study of a foreign language involves the active complementarity of classroom and independent work. This approach allows increasing the potential of foreign language education in a great measure, since independent work provides additional opportunities for personalizing the educational process for students by choosing the most appropriate methods, means, and teaching methods for it, depending on the prevailing conditions.

Modern learning management systems, such as Moodle, enable educators to effectively integrate adaptive automated settings into electronic content, providing greater flexibility and a student-centered educational environment. The improvement of electronic educational resources in terms of adaptability to the individual characteristics of students contributes to an increase in their internal motivation, satisfaction with academic performance, the development of educational autonomy, optimization of the educational process through careful selection of priority points in the course content, which ultimately ensures the effective formation of foreign language competencies.

As an option for organizing personalized independent work in an electronic course, diagnostic tests (tasks) can be integrated into a training module. Depending on the result of completing the task of the first module, the student gets access to the next task corresponding to his level of mastery of the material. The introduction of personalization elements into an electronic educational course enhances the true motivation and stimulates the student's genuine, internal activity. The successful completion of the task by the student, therefore, is supported by the emotional positive response of students to the tasks they perform.

Thus, personalized adaptive learning can be adjusted automatically and use decisions on the basis of the data collected by an automated system. Learning adapts to the conditions of specific learning activities in real-time and ensures that the content and activities correspond to individual characteristics and needs, therefore, with the development of modern technologies, personalized learning will become more and more adaptive, and adaptive learning will become more and more personalized.

The introduction of personalization elements in the electronic course of the discipline requires significant efforts of teachers to study the individual needs, characteristics, goals, motivational attitudes of students, a detailed analysis of the data obtained, but allows achieving high efficiency of methodological work aimed at developing an adaptive “product”.

Thus, personalized adaptive teaching of a foreign language seems to be a promising direction in the research of innovative methods of linguodidactics using information and communication technologies.

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PROBLEMS AND THREATS IN THE IMPLEMENTATION OF BIOMETRIC IDENTIFICATION TECHNOLOGY

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Abstract. Under the pretext of improving the level of public security, additional public surveillance cameras are installed every year. Thanks to the integration of face recognition systems, the detention of criminals and the search for video evidence of a crime has become many times more efficient. However, in practice there are problematic situations in which personal identification is difficult to use due to the physiological and biological characteristics of a person. The article provides an overview of the threats to the introduction of biometric identification technology.

Keywords: facial recognition technologies, anonymity, identity forgery, data leakage, information security.

ПРОБЛЕМЫ И УГРОЗЫ ВНЕДРЕНИЯ ТЕХНОЛОГИИ БИОМЕТРИЧЕСКОЙ ИДЕНТИФИКАЦИИ ЛИЧНОСТИ

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Аннотация. Под предлогом повышения уровня общественной безопасности ежегодно устанавливаются дополнительные камеры общественного видеонаблюдения. Благодаря интеграции систем распознавания лиц, задержание преступников и поиск видеодоказательств совершенного преступления стали в разы эффективнее. Однако на практике встречаются проблемные ситуации, при которых идентификация личности из-за физиологических и биологических особенностей человека сложна в применении. В статье произведен обзор угроз внедрения технологии биометрической идентификации личности.

Ключевые слова: технологии распознавания лиц, анонимность, подлог личности, утечка данных, информационная безопасность.

Face recognition is a method to determine or confirm a person's identity by their face. The facial recognition system can be used to identify people in photos, videos, or in real-time. Facial recognition is a category of biometric authentication systems. When using various techniques that obtain bio-physiological characteristics of a person, their privacy rights have to be respected, in addition to the state's interests in the fight against crime (terrorism, corruption). The state's regulation and development of the efficient usage of information technology is key to relieving public doubt of its effectiveness and legality [1]. Those systems have numerous risks along with negative aspects:

- Possible leakage to third parties
- Absence or lack of a regulatory framework
- Identity forgery using 3D printing
- The possibility of error when using law enforcement agencies (95-97 % accuracy of systems)
- Loss of anonymity on the web
- Dampness of systems that are already in use
- Stealing data from databases
- Violation of ethics and religion

On the one hand, in the Russian Federation, there are no clear instructions or algorithms for the use of cameras with face recognition functions that would satisfy the requirements of society to keep private life secret. On the other hand, cameras with face recognition ability can assist law enforcement agencies in locating wanted persons and detecting (uncovering) crimes [2].

Biometric data leak

In case of leakage and compromisation of your password, you can install a new one as soon as possible. If your biometric data got leaked from any organization that uses facial recognition technology, you can't do anything about it. Moreover, if your biometric data got leaked from at least one source it will mean that absolutely all your registrations are in the risk zone, and there's no chance to fix the situation. In the future biometric data will be used for more services, so if unscrupulous third parties take possession of your data, the risk of their misuse will only increase; 72 % of biometric data leaks were intentional intent of employees for personal gain.

Anonymity

The existence of facial recognition technology completely deprives a person of the possibility of anonymity on the web. Once you upload a photo to a social network, the information about this photo and this photo itslef remain on the Internet forever. Despite the fact that even if a person did not post their own photos, they can get in random photo on the street or friends' picture. There are public facial recognition systems that, with just one photo of the person, can find the person's name, where they live, and their social circle. The general availability of facial recognition systems makes it possible for attackers to easily find information about their victim and deprives

ordinary people of anonymity on the network and their privacy rights. An example of the use of a recognition system by intruders is the USA. In the United States of America, the attackers connected to a network of video cameras so the computer independently tracked the woman's location movements. With the help of this, the attackers got information about when the house is empty and its owner is far away. This example proves that new benefits and amenities in the form of convenient identification can be harmful.

The normativity of face recognition

At the moment, facial recognition systems are already widespread in Russia, but at the same time, there is no legal framework. Because of this, there is an urgent need for additional state regulation and the development of standards for the use of video cameras that allow the identification of a person and comply with the constitutional rights of citizens to privacy and the protection of personal data. Furthermore, it is important to legislate the duty of medical institutions to report to the Ministry of Internal Affairs of Russia about plastic surgeries performed that change person’s appearance [3]. Otherwise, an attacker may steal the image of another person and use a fake identity with malicious intent, like the use of someone else's money, etc.

Biometrics are used so widely in China that the issue of personal data protection seems to be of little concern to the country's authorities. For example, to control gambling addiction among teenagers "Midnight Patrol" system was launched. Now gamers have to scan their faces and register under their real names otherwise they will automatically be identified as minors and won't be permitted to play in the evening and at night. All this restricts human rights and freedoms – a citizen below legal adulthood age doesn't have the opportunity to choose their leisure time.

Errors of facial recognition systems

Retail, security, banks, catering, logistics, medicine – this is not a complete list of areas where facial recognition systems managed to enter and where they were able to gain a foothold. The technology is spreading so fast that it scares the public. For example, Russian human rights activists believe the work of such systems should be limited. And people's fears are well-founded. Algorithms designed for convenience and security sometimes work against users. Over the past few years, several major scandals have occurred in Russia and the world related to the use of automatic biometric identification systems. The facial recognition system in the police database identified a 70 % similarity between Yermoshin with the criminal, who also wore glasses and similar autumn clothes. The real criminal was trading previously stolen game consoles on the market. As a result, Yermoshin had to participate in lawsuits and defend his innocence. Russians aren't the only ones suffering from biometric identification errors. In 2019, Usman Bach, an American student, sued Apple. In the lawsuit, he claimed that the facial recognition system in the company's stores falsely linked him to the criminal. Shortly before the incident, the student lost his driver's license. He assumed the attacker who found the document used it to confirm his identity when buying in the store. At that moment, the video surveillance system connected Bach's name with another person's face, who later committed several more thefts in different cities and

states. Even an investigator from New York agreed with this version. However, in other jurisdictions, Bach is still accused of theft – even though he has an alibi [3].

In China, a project is getting implemented that many consider an embodied dystopia – a social rating system. Each country resident has a profile with points – they get awarded for exemplary behaviour and work that benefits society. For violations and misdemeanours, points are taken off; a low or negative rating will cause problems: loan denial, foreign travel prohibition, or even job loss.

The face recognition system is getting tested on Huawei's 5G communication networks. To pay for the fare, passengers of Futian station need to approach the turnstiles with a special tablet. In the UK, however, they did not appreciate the value of CPL in the subway – in the London Underground, the system led to 98 % of false positives, which led to money written off from other people.

Violation of ethics and religion

Neural networks have been accused of racism and discrimination by Americans. Algorithms learn from databases that mostly contain photos of white people. As a result, the systems are worse at identifying Asian, Latino and black faces. These categories are often recognised by criminal identification software. As for the violation of religious norms, the negative aspects mainly concern Islam followers. That is because Muslim women are supposed to show their faces only to relatives. However, it is possible to leak information, and getting a woman's face into public access violates religious norms. In general, neural networks work effectively, but not perfectly. And even the tiniest mistake can break someone's life. The question is, who and how will use the massive databases of biometric data?

The united centres for storage and processing of data will sooner or later become hacker attack targets. Information about people's movements and the places they visit will be freely available. This data may be used by scammers, blackmailers or even foreign special agencies. There already were precedents when participants of a Moscow 2017 rally's personal information got leaked to the web [4].

There is a lack of legal framework: the law of personal data (PD) and administrative codex only partially address the issue of video fixation violations. Identification of a persona using face recognition automatically means the use of PD without the consent of the owner. The lack of regulation can cause abuse of information usage, mistakes in operative law enforcing actions or court rulings. Identify forgery: 3D printing will soon allow the easy creation of masks that are identical to any human. The outcome of such a scenario is described in films about Fantomas. The camera recognises a person with 95-97 % accuracy, but an individual with malicious intent may be hiding under the fake "face"[3; 4]. Without extra proof, the court may make a mistake if it was to rely solely on information obtained by surveillance camera.

Biometric identification has great prospects, but the dangers that come into our lives with them look very realistic. System developers and legislative bodies should study the results of the latest research on the vulnerabilities of biometric systems and promptly finalize both identification solutions and regulations governing their work.

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УДК 323.1

INTERCULTURAL CONFLICTS IN CONTEMPORARY AFGHANISTAN

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Abstract. This article examines the problem of intercultural interaction due to the specificities of the Afghan state and society. It is one of the brightest, both at the domestic level and in the international arena. The study and search for solutions to inter-ethnic, inter-confessional and inter-cultural conflicts remain the most important tasks for contemporary researchers in view of their exceptional significance for the existence and functioning of the state.

Keywords: ethno-religious conflicts, ideologies, ethnic minorities, culture.

МЕЖКУЛЬТУРНЫЕ КОНФЛИКТЫ В СОВРЕМЕННОМ АФГАНИСТАНЕ

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Аннотация. В данной статье рассматривается проблема межкультурного взаимодействия. В силу специфики афганского государства и общества она является одной из ярких как на внутригосударственном уровне, так и на международной стезе. Изучение и поиск решения межэтнических, межконфессиональных, межкультурных конфликтов остаются важнейшими задачами для современного исследователя ввиду их исключительной значимости в вопросах существования и функционирования государства.

Ключевые слова: этнорелигиозные конфликты, идеологии, этнические меньшинства, культура.

The Afghan crisis today is a multifaceted and multifaceted phenomenon involving a number of domestic problems of a socio-economic and political nature as well as international problems that include the threats of radical Islamization, extremism, the spread of terrorism and drug trafficking that go far beyond the regional level. However, cultural issues have played the first role throughout Afghanistan's formative history and continue to do so today.

The oppression and forced assimilation that lasted until the mid-twentieth century, the Islamisation of Nuristanis and the genocide of Hazara, intensified ethno-regional struggles and created a crisis of intercultural relations between Pashtun and non-Pashtun nations. Discrimination on ethnic grounds was an integral part of state policy among Pashtuns, manifested through land and taxation policies that deprived

non-Pashtuns of their property and land holdings, converting them into allotments, while others, such as Tajiks and Uzbeks, were subjected to heavy taxation [1, p. 156].

Over several decades an “ethnic hierarchy” was established in which Pashtuns had a privileged position, followed by Tajiks, Nuristanis, Baluchis, Turkmens and, last but not least, Hazards. In many respects this arrangement can be attributed to religious and cultural factors that vary greatly in each part of Afghanistan. Similarly, ethnic strife was sown and sustained by the Pashtun government by pitting militias and tribes against one another to prevent rebellion and weaken both sides, a kind of feud that has endured for years. A tentative ethnic map of contemporary Afghanistan is thus drawn as follows: Southern Afghanistan is populated by Pashtuns (42 per cent), the north-east by Tajiks (27 per cent), north-west by Uzbeks (9 per cent), east by Nuristanis (less than 1 per cent) and central Afghanistan by Hazards (10 per cent). However, the freely available census is outdated and has nothing to do with reality, political scientist Homid Saidov said: “It is wrong to think that since Pashtuns created Afghanistan, they are the ethnic majority” [2, p. 159].

Against the background of the Afghan conquests of the early twentieth century, the position of ethnic minorities was rather precarious: any disobedience to the central government could have negative economic and socio-political consequences. This factor, at different stages, facilitated integration processes and the formation of ethno-regional political elites, later expressed in the party apparatus. Within the framework of the step-by-step ethnic organization of Afghan society let us analyze the main cause-and-effect links of the considered issue from a historical and cultural point of view.
To this day, the latter factor has a negative connotation, because “Afghan” is associated with “Pashtun”; this reinforces indifference and segregation among ethnic minorities and encourages nationalist sentiments [3].

At present, the Taliban (a terrorist organization banned in the Russian Federation) plays a key role in the development of the country's cultural situation. The Taliban* has two key developmental phases in its history: 1994-2001 and 2021-modernity. Despite the Taliban leader’s rhetoric of softening their politics, there are more similarities than differences: virtually unchanged for twenty years, as in 1996 and 2021, they are political players in the struggle for power in Afghanistan and partly in Pakistan, their ideological basis remains the same, implemented in practice [4]. Furthermore, when it comes to the ethnicity of the Taliban, most sources indicate that the Pashtuns are multiethnic, but there are no analytical reports to back this up. Accordingly, it would be wrong to label the group as exclusively Pashtun or ethnically oriented – the Taliban themselves refute the priority of ethnicity in their movement's ideology.

Given the age-old adherence of most Afghan Muslims to the Hanafi maslhab, one of the most moderate and tolerant currents, the deobandists were trusted and justifiably supported by society. However, the Taliban's mass promotion of the idea of an “ideal Islamic state” based on "correct Islam", Sharia law and local Pashtunwali law has given rise to religious and political extremism in Taliban circles in view of their ambition to radically reshape Afghanistan, thus giving rise to a serious debate on the Taliban maslhab. This is tied to the need for an Islamic revolution in Afghanistan, which is at odds with the values of Afghan society. Many political scientists agree that

the “new Islamic wave” or “re-Islamization” is a danger to the Central Asian region as a whole: one of its consequences tends to be the undermining of political stability and the violation of human rights and freedoms. The other side of the scholarly discourse is more rational in that it does not see the new wave of Islamisation as necessarily dangerous, since religion has never been a priority in the lives of Turkic or Pashtun tribes, for instance, and active campaigning will therefore not find any followers [5].

The latter see the key role of the Pashtun code and its supremacy over the confession, as H. Hekmatyar’s statement that he is Pashtun first and Muslim only afterwards confirms. Islam is not alien to Afghan culture, but fundamentalism is a phenomenon against its nature. The most successful model of an Eastern state, with a predominantly Islamic religion, has been a synthesis of Islamic and secular approaches in political and social terms. In response to the challenges of modernity, given the overweening societal discontent with economic and political well-being and the crisis of post-colonial nation-states in the East, the result has been a resurgence of the idea and indeed the ideology of the “Islamic state” [5].

Consequently, the leading role in Afghanistan has been played by abrupt changes in cultural and political ideologies, which are not without conflict. Thus, the replacement of one ideology by another, while maintaining the continuity expressed in tribal relations, played only a destructive role in the formation of the Afghan nation and the general cultural policy in the state, causing conflict in intercultural relations. Neither Soviet nor democratic ideologies could take root in this eastern state. The difficulty of defining an “ideal ideology” for the Afghan state that takes into account the aspirations of each incorporated culture remains a central issue that has not been resolved to this day. When it comes to group ideology, based on the facts described above, it should be noted that Afghanistan is not ready for optimal multiculturalism or multiculturalism.

With the rise of the pro-Islamic Taliban to power, the situation remains in limbo. Today, there are at least two scenarios. The first is that history will be cyclical: unresolved intercultural tensions will cause a new crisis; the regional threat may grow and require a response from the international community, if not a military invasion for regime change. The second outcome, positive, is that the Taliban will fulfil all its international obligations and have its power recognized not only by the international community, but also internally, and thereby begin a process of stable development of the state. In this case, the general vector of aspirations would be the first step towards resolving domestic and international problems and reducing the risks and threats of social tension in the region. The latter option sounds utopian, given the current state of the state as it seeks to establish a ‘stronghold of Islam’ under the auspices of the Taliban.

Afghanistan needs to build a new image – that of a dignified, democratic Islamic state, ready to deal diplomatically with the world community without further problems and ready to build good neighbourly and peaceful relations with the countries of the Central Asian region (Afghanistan wants to have very good relations with everyone). Afghanistan is a global actor on an equal footing, which has to be “taken into account”. The internal political and social conflicts, according to the Taliban, are on the wane, which means that the time has come for Afghanistan to use its right to political self-

determination, where, by the will of the people and the will of the “servants of the nation”, a theocratic path of development has been chosen.

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SMOKING AS AN ENVIRONMENTAL FACTOR

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Abstract. Smoking affects individual organisms and the environment and is an environmental factor of anthropogenic nature. Thus, no matter what state the ecology is in, no matter how dense the smog of the big city is, one constant remains unchanged for a smoker – chronic poisoning by powerful poisons that are contained in tobacco smoke. The purpose of my work is to study the impact of smoking on the environment and ecology.

Keywords: smoking, smoke, pollution, waste, tobacco, nicotine.

КУРЕНИЕ КАК ЭКОЛОГИЧЕСКИЙ ФАКТОР

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Аннотация. Курение оказывает влияние на разные организмы и окружающую среду и является экологическим фактором антропогенного характера. Таким образом, в каком бы состоянии ни была экология, каким бы густым ни был смог большого города, для курящего человека остается одна константа – хроническое отравление мощными ядами, которые содержатся в табачном дыме. Целью данной работы является исследование влияния курения на окружающую среду и экологию.

Ключевые слова: курение, дым, загрязнение, отходы, табак, никотин.

Smoking is the process in which a person consciously inhales smoke, the methods and means include several dozens of variations. The most common are

considered to be smoking cigarettes, smoking mixtures with hookahs, smoking tobacco with mouthpieces and pipes. The main reason and consequence of mass smoking is considered a narcotic effect of nicotine on smoker's body. In the International Classification of Diseases, tobacco addiction has a code F17. Many give to smoking the status of a bad habit.

I will not pay attention to the harm of smoking on the human body and society in general. I want to notice that the monitoring and prevention of this process is engaged in science, public health attributing this habit to diseases and fighting with consequences of this process [1].

Of the wide range of reasons for using cigarettes, the main ones can be identified:

The need for constant stimulation of the senses;

1. Nervousness, anxiety;
2. Inability to relax and cope with stress;
3. Social stiffness, nervousness and timidity in front of people;
4. Susceptibility to boredom;
5. Weak willpower;
6. Delusions caused by lack of information: a fairly rare case due to worldly anti-tobacco propaganda and the availability of information, but may be frivolous someone thinks that tobacco smoking is almost no harm, and therefore smokes.

Smoking a cigarette, with all its consequences, makes a person more indifferent to the world around them. The smoker gets into an inadequate state of a kind of "blackout", during which his psycho-emotional balance is disturbed

I want to emphasize the impact of smoking as an anthropogenic factor affecting the environment, both natural and anthropogenic. From the ecological point of view, I would like to divide the process of smoking into stages:

The first stage: is associated primarily with the process of creating a final resource, I mean a pack of cigarettes or a smoking mixture. The product as the term I am going to use has the meaning of a finished product which has to be understood this way because tobacco, a cigarette or a smoke mixture cannot be considered a foodstuff because it does not nourish and does not carry any nutritional and important elements for the organism. In order to become a cigarette, the tobacco in it is grown under specially prepared conditions and goes through a complex production process that has a negative impact on the environment. The first important aspect of tobacco production is the cutting down or complete destruction of forests (deforestation). The fact is that the cultivation of tobacco culture requires impressive areas of fertile land, as well as large volumes of wood for the construction of dryers and the actual drying of tobacco. For tobacco cultivation, forested areas are selected, which are destroyed and turned into agricultural land. Together with the forests, the habitats of animals, which are forced to leave these places, are destroyed. Part of the animals unable to leave the areas, as well as most of the forest flora in the form of woody, shrubby, wood-shrubby vegetation, herbs, mushrooms, mosses – are killed. The result of tobacco production is tobacco products – cigarettes, cigarillos, cigars, and so on. All of these products consist

primarily of nicotine, various resins, and contain carcinogens, heavy metals, and environmentally hazardous compounds. In turn, any production is regulated by laws prescribed in the Constitution of the Russian Federation and the pollution that occurs during the production of the "product" is regulated by the Federal Law of the Russian Federation dated January 10, 2002 N 7-FZ "On Environmental Protection". You may be surprised that I have included the stage of production in the first stage of the anthropogenic factor of smoking, but I emphasize the habit as a factor of pollution and link the habit to production only for the reason that there is a polluting factor in the process of production, which I can not fail to notice [2].

The second step: the process of smoking, from lighting the tobacco, cigarette or smoking mixture to extinguishing or stopping the smoke inhalation. Of course, the process of smoking releases some smoke and ash into the environment. Divided into components, smoke and ash can be divided into such elements referring to the data of American researchers: tobacco smoke contains more than 4000 different chemicals of varying degrees of toxicity, nicotine, benzene, formaldehyde, hydrogen cyanide, carbon monoxide, and even found radioactive polonium 210.

The Ministry of Nature and Environment does not monitor this release as a factor of environmental impact, and in my opinion, this is strange. The consequences of smoking in the society are fought by public health, but with the consequences of smoking in the environment I did not find any law regulating or in any way touching the section of smoking as anthropogenic factor. The only link that can be reckoned with is the MPC of pollutants [3].

The third stage: the waste of smoking, I mean the butt, as well as the packaging in which the product is contained. I want to point out that human waste is handled by the Ministry of Nature, prescribed in the law on waste. If you evaluate a butt as a waste product with two important negative factors:

1. Contamination by elements that are trapped in the filter, i.e. 4,000 different chemicals trapped in the filter and the filter itself with the packaging. Cigarette filters are most often made from cellulose acetate, a type of plastic. It takes about 20 years for them to decompose, but not to disappear completely, but to become microplastic. We stop seeing it, but it stays in the water, mixes with the sand, and can end up on our plates along the food chain.

2. The heat of a smoldering unextinguished cigarette butt, a common cause of fire. Unlit cigarette butts left to their fate in the forest cause about 7 % of forest fires, which are known to be capable of spreading instantly, causing major destruction and death to animals.

The result of the third stage of smoking is expressed in significant soil contamination with the elements contained in the cigarette butts. I want to draw your attention to the fact that the presence of nicotine in the soil is not normally observed, i.e. nicotine is a poison not inferior to hydrocyanic acid in its toxicity single dose of nicotine fatal to humans is equal to 0.08-0.16 grams. The negative effect of nicotine on

plants and animals can only be assumed because the maximum permissible concentration of tobacco dust – 3 mg/m3, for nicotine sulfate – 0.1 mg/m3 [4].

Nicotine is extremely toxic to insects and cold-blooded animals. It acts as a neurotoxin, causing paralysis of the nervous system (respiratory arrest, cardiac arrest, death). Nicotine decomposes rapidly into constituents in contact with acids, forming salts in the environment. We can characterize a smoldering unextinguished cigarette butt in terms of anthropogenic factor by highlighting the characteristic consequences, i. e. fires that occur in places where a smoker has set foot. Such places, of course, along all roads, trails, towns, villages, etc. we do not have any restrictions and distinctions between people who smoke and non-smokers. Thus, considering the number of fires arising in the human environment, correlating the percentage of smokers to the proportion of the population previously subtracting the possible percentage of accidental fires caused by lightning, glass bottles, accidental arson or even deliberate considering the time. You can isolate the percentage of fires that occur in that time [5].

It would be unfair not to point out people who are passive smokers. A person who is in the same room as a smoker inhales 70-80 % of the most hazardous components of the byproduct tobacco smoke. "Secondhand smoke" increases the risk of developing various diseases. When tobacco is smoked, up to 6,000 to 6,000 percent of the most hazardous combustion products are produced in the products combustion products produce up to 6,000 different constituents, including such as nicotine, carbon monoxide, tar-like substances, resins (have oncogenic properties), radioactive isotopes (bismuth, lead, potassium, etc.), heavy metals. Tobacco smoke, which is immediately released into the atmosphere,
is 3 times more dangerous than nicotine and tarry substances, 4 times more dangerous than benzopyrene and 45 times more dangerous than ammonia.

45 times more dangerous than nicotine and tar. Its deleterious effects occur wherever smoking is permitted. A major concern is the exposure of the younger generation to secondhand smoke, which increases the risk of nicotine addiction in children. Staying in a smoky room for one hour has the same effect on a person as Four cigarettes smoked one after the other.

In my opinion, smoking as a factor of environmental impact is currently underestimated by society. Inclusion of this factor in ecology as a science of human interaction with the components of nature will happen soon. Given the increase in the number of smokers and the scale of the ever-increasing negative impact. Probably it will not be necessary, if people in their consciousness change their attitude to smoking and get rid of this addiction or disease harmful to everything around and themselves in particular.

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CHINESE EXPERIENCE OF CREATING NATION DIGITAL CURRENCY

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Abstract. The creation of an electronic currency in China, as well as its ability to respond to the challenges of the global market, are in the center of public and research attention. Our task is to give an idea of DCEP in China by summarizing the main characteristics and mechanisms, the intended purpose of the release and background information, to conduct an initial analysis of the expected consequences of the introduction of DCEP, as well as to assess the possible consequences for the Chinese economy, society and the international economy in particular.

Keywords: China, digital yuan, crypto currencies, Chinese economy.

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Аннотация. Создание электронной валюты в КНР, а также ее способность ответить на вызовы мирового рынка находятся в центре общественного и исследовательского внимания. Нашей задачей является дать представление о DCEP в Китае путем обобщения основных характеристик и механизмов, предполагаемой цели выпуска и справочной информации, провести первоначальный анализ ожидаемых последствий внедрения DCEP, а также оценить возможные последствия для китайской экономики, общества и международной экономики, в частности.

Ключевые слова: КНР, цифровой юань, криптовалюты, экономика Китая.

The Digital Yuan is a means of payment issued by the People's Bank of China, which, unlike other cryptocurrencies, is legal and has absolute transparency in the various transactions in which it is used. The digital yuan, along with physical cash, is legal tender. It can be used to pay taxes, for example. This is its main difference from the same bitcoin. Information about the beginning of the development of the national

currency of the PRC appeared in 2014, when the People's Bank of China created a special group to conduct research on digital currencies. But only in 2017, the development of DCEP was started by several of the largest banks in China [1]. In the spring of 2020, the head of the People's Bank of China, Yi Gang, said there was no official launch schedule (DCEP), but acknowledged that it was being tested in four cities - Shenzhen, Suzhou, Xiong'an and Chengdu - and the Beijing Winter Olympics venues. The People's Bank of China and major state- owned commercial banks led a pilot project in collaboration with well-known ISPs to test various forms of use [2]. Beijing and Zhangjiakou are also added to this experiment as a result of how the digital yuan was tested during the Winter Olympic and Paralympic Games in May 2022. As of the end of 2021, the total volume of transactions using the digital yuan in China was almost 87.57 billion yuan (13.78 billion US dollars) [3].

The People's Bank of China did not comment in detail on how China's digital renminbi (DCEP) is planned to be released, but some papers, lectures, and other materials from People's Bank of China officials reveal a number of key features and how it works. For example, a recent article by Fang Yifei, Vice Chairman of the People's Bank of China, published in September 2020, defines a "two-tier operating system." According to its definition, a commercial bank with a strong capital base and high technological capabilities will act as a "designated operating agency" to open digital wallets and convert to DCEP for customers. In addition, these agencies will be responsible for services such as payment products, innovation, market development, system development, business processing and maintenance, in cooperation with other commercial banks, and the like. Mu Changchun, Chairman of the People's Bank of China Digital Currency Research Institute, said that several designated operators are using different technical paths and that a good path that is finally accepted by the market will eventually win the race. This is suggestive of his expectation of competition between several large state-owned commercial banks for innovation. Regarding the difference between DCEP and private digital payment services, Mu said the line between the two would not be clear to the public, adding that the basic payment function of DCEP would be similar to QR code payment systems such as private payment giant Alipay. However, DCEP will be managed in a digital wallet separate from the savings account, and the payment flow should be different from Alipay and the like. Alipay and other payment methods are linked to the user's savings account (The main payment in Alipay and other services can be divided into payment after transferring funds from a savings account to a wallet and bank transfer from a linked savings account). In contrast, when paying with DCEP, the money in the savings account will first be converted to DCEP [4].

The People's Bank of China has also introduced appropriate systemic restrictions in order to prevent the rapid flow of funds from bank deposits of commercial banks into the national digital currency. Therefore, according to Mu Changchun, the introduction of the digital yuan will not have a significant negative impact on the current financial system, since a wide range of economic agents, even in a stressful situation, will not have an incentive to transfer most of their deposits from financial intermediaries to the digital yuan. Also, in case of a stressful situation, a fee for large or frequent withdrawals of funds from the digital yuan can be introduced [5].

The right to issue electronic yuan belongs to the state. The PBoC is at the heart of the DCEP operating system. It issues e-yuan to authorized operators, which are commercial banks, and manages e-yuan throughout its life cycle. Meanwhile, it is authorized operators and other commercial institutions that exchange electronic yuan and distribute it to the public [6]. Users of the currency will have a digital wallet on their phones or electronic devices and will be able to transact for goods and services by transferring the digital currency to each other. Records of each transaction are likely to be kept centrally by the People's Bank. The 8 large state- owned commercial banks are expected to not only perform basic operations such as opening digital wallets and providing DCEP conversion, but also offer payment services in cooperation with private payment service providers.

According to the former head of the Bank of China, Li Hui, a regulated token (CBDC) can replace cash. He clarified that the possibility of the digital yuan becoming the dominant form of currency and the main means of payment will depend on whether it will have greater efficiency, lower transaction costs, large- scale adoption and mass adoption by people. According to his words, the digital yuan, like bitcoin, will be anonymous. However, the Central Bank will set limits on the frequency and amount of anonymous transactions for each CBDC holder [7]. This has huge implications for politics and society. It is also important to note that in China, digital money already exists in the form of bank reserves at the PBoC and household and corporate deposits at banks, which are much larger than cash in circulation. It should be stated up front that for now, digital yuan will circulate alongside physical yuan, but in the long term, the abolition of physical cash will expand the range of benefits (and potential costs) from digitalization. Consider the fundamental principles of the digital yuan [8]:

1.The possibility of offline payment, in particular, CBDC can be paid as physical money.

2. Improved security. The digital yuan could provide full transaction reporting functionality. In particular, the payment is made using smart contracts with digital currency, which will prevent the possibility of fictitious reports, interception of funds or facts of illegal enrichment;

3. Multilevel system. For payments or transfers of large amounts, you must use a wallet with a real name and high information content; for small amounts, confirmation is not required;

4. High transparency. Provided that the competent authority has issued the necessary legal documents with strict adherence to all procedures, appropriate data verification and cross-comparison can be carried out to ensure the fight against data theft or substitution crimes.

Considering how quickly Chinese consumers have embraced mobile payment systems, we shouldn't be surprised if CBDC replaces a large part of the physical cash economy within a few years. Digital wallets will eventually also partially eliminate the need for electronic payment systems such as Alipay. In fact, the adoption of a CBDC, assuming cash is still an alternative, will depend heavily on a CBDC providing security features similar to cash, but with increased convenience and/or lower cost to the user than existing ones.

A CBDC can have a positive impact on monetary policy, the fiscal system, the banking system, and government in general. After all, CBDCs will provide full transparency of operations, which means that it will be extremely easy for the state machine to track them. As a result, the regulator will have full control over all transactions with CBDC: it can manage the widest range of operations or user accounts. Moreover, CBDC will dramatically increase the powers of central banks, which, in turn, will affect the entire banking system. CBDC will allow the regulator to reduce to insignificant indicators the risk of situations when borrowers cannot return money to the bank or compensate its expenses with their property [9].

The CBDC has the potential to increase seigniorage for the central bank and gain seigniorage from the commercial banking system. Seigniorage is usually viewed as the difference between the face value of a currency and the cost of producing it. In the case of fiat or fiat currency, seigniorage is high, but with digital currency it will be even higher because the costs are negligible. In a fractional banking system, where commercial banks create deposits through lending, and deposits are no worse than cash and therefore almost money, significant seigniorage is accrued not to the state that issues coins and banknotes, but to commercial banks. Bank deposits are mostly interest-free and banks can then create them while loans attract interest payments. While China's banking system is largely state-owned, and therefore seigniorage charged to banks is also charged to the state, this is obviously not necessarily true in other countries. The consequence for China of allowing individuals and companies to bank directly with the PBoC will be greater control over the creation of money, and with it an increase in the ease of financing budget deficits by issuing money, provided, of course, that inflation is curtailed and user confidence in the currency. Combined with real-time information about the consequences of monetary expansion, the CBDC could allow China to maximize the domestic benefit of a monopoly on currency issuance [10].

The transparency provided by the PBoC, and therefore, presumably, by the participating state as a whole, through the CBDC, can bring some key benefits to the state: increased efficiency and scope of stabilization policies; greater powers to raise taxes to close the "tax gap"; greater control over the financial system to eliminate systemic risk and greater seigniorage from issuing currency. Moreover, if the improvement in CDC efficiency is as significant as it may turn out, China's advantage as a first mover among the world's largest economies could further expand the use of the yuan in international transactions, which in turn could accelerate the use of the yuan as a reserve currency. This could have far-reaching geopolitical implications, as it would allow, among other things, countries and companies to circumvent the SWIFT system, making it more difficult to apply economic sanctions. If so, it's no exaggeration to say that the move to CBDC has the potential to be an era-defining event.

The PBoC digital currency project, which was previously called "Digital currency for electronic payments (Digital currency, DCEP)", is now renamed and referred to as «Digital Yuan (e-CNY)» [11].

The main motivations for developing a digital currency of retail payments in China are [12]:

1. maintaining the demand for money from the Central Bank and expanding the population's access to financial services;

2. promoting monetary sovereignty by issuing a national digital currency while simultaneously prohibiting in China all types of transactions with cryptocurrencies, digital tokens, or cryptocurrencies systems that are externally linked to classical currencies that are widely used in the country;

3. encouraging competition in the retail payment market with Ali Pay and WeChat Pay private payment systems and ensure the safety and efficiency of payments;

4. the need for digitalization of the economy through the widespread use of artificial intelligence in the financial sector, big data and their merger, in general, the development of financial technologies;

5. the need to build a system of digital authoritarianism, in order to increase party discipline, and tighten state control over transactions of citizens and companies;

6. development of more flexible instruments of financial policy and monitoring of shadow banking;

As identified by China's E-CNY research and development [12], e-CNY basically replaces cash in circulation (M0), which is the most liquid form of money. According to the current experimental situation, the issuance and exchange of e-CNY can be divided into four channels: first, users can directly exchange e-CNY for traditional CNY (including coins and banknotes, traditional CNY and e-CNY are used as a distinction). Secondly, users take the initiative to exchange e-CNY through the e-CNY wallet of commercial banks as operating institutions. Third, e-CNY is distributed to users' e-wallet through commercial bank channels in the form of wages and red envelope subsidies, but the central bank does not directly distribute e-CNY to individuals because e-CNY uses a two-tier operating system. Fourth, transfer between CNY electronic wallets. These four channels of issuance and exchange will affect China's monetary structure in different ways. E-CNY will replace most of the fiat yuan, and overall demand for M0 will first increase and then decrease. Since the reform and opening in 1978, with the rapid development of the economy, the total amount of M0 has continued to increase from 21.2 billion yuan in 1978 to 9.08 trillion yuan in 2021, with a cumulative increase of 428 times in 43 years and an average annual an increase of 15.13 %. Since 2012, the growth rate of M0 has decreased significantly, of which the growth rate in 2014 was the lowest at 2.88 %, and in recent years the growth rate has recovered slightly. Although the absolute number of M0 is still increasing, the net supply and growth rates show a clear downward trend. This change reflects the increasingly clear substitution effect brought about by the rapid development of debit and credit cards and third-party payments in place of traditional cash. The issuance of e-CNY can amplify the expansionary effect of the money multiplier, it can also influence the supply of base money and increase the volatility of the overall money supply. Relying on its unique issuing technology, it can better control the number of e-yuan. In addition, e-CNY has many technical advantages, for example, it can be managed and anonymous, solve the problem of payers tracking funds flows between objects and levels, track funds flow within the control of the initiator, protect user privacy, and configure currency tracking support. The issuance of e-CNY will also

reduce the time lag of interest rate channels and better match the requirements of financial services to the real economy [13], the application of big data analysis will increase the ability of the central bank to adjust market interest rates through monetary policy instruments. It can also help provide more and more real-time information, thereby making interest rate adjustments more sensitive and more in line with current market conditions. With the control method based on the conditional trigger of the loan interest rate, the base interest rate can be effectively transferred to the real-time loan interest rate, and the delay problems of monetary policy transmission caused by the loss of control over money can be resolved. The conditional trigger control method at a certain point in time can effectively solve the current problem of the current operation of the monetary policy, so that the moment of currency entry into force is not limited to the current currency issue, but is extended until a certain point in the future in accordance with the policy objectives, avoiding downtime money and thus reducing the delay in the transmission of monetary policy.

According to Article 3 of the Law of the People's Republic of China on the People's Bank of China, the purpose of China's monetary policy is to maintain the stability of the value of the currency and thereby promote economic growth. At present, the digital economy is becoming the new blue ocean and the new driving force behind China's economic development. The convenience, security, and stability of e-CNY is also consistent with the speed and efficiency of the digital economy, which will contribute to the rapid development of China's digital economy. In addition, the issuance of e-CNY can prevent financial systemic risks, reduce the moral hazard of commercial banks, non-bank payment institutions and other private institutions, greatly reduce the space for illegal activities, and make economic development more stable. Due to the limited scope of the e-CNY pilot project and the small amount of published data, some scholars have modeled the economic impact of the e-CNY. They found that the impact on the banking system and financial structure is manageable. In the long run, this will help increase the volume of economic production [14].

National power stems from many sources: population size, technological progress, economic and industrial prowess, and military power are some of the most obvious factors that have contributed to a nation's rise to regional or global hegemony at various times. The instrument of soft power has played and continues to play an important role, while cyber dominance has added a new dimension to national rivalry. Financial sophistication is often overlooked, but more often than not it is the deciding factor; in particular, the ability to raise taxes, borrow money, and extract seigniorage.

Monetary systems, financial innovation, and global power have often gone hand in hand. Let' consider, for example, the discovery of silver at the Potosi mines in Bolivia in 1545. The vast quantities of silver found in the New World, combined with technological advances in the extraction of the metal, played a decisive role in the struggle of the Habsburgs of Spain for European dominance. The purchasing power provided by Spain's silver imports helped finance its wars in continental Europe, but the ubiquity of silver coins also pioneered world trade in the modern era. The financial revolution in England in the late seventeenth and early eighteenth centuries contributed to its rise to the status of a European great power and, ultimately, to global hegemony [15].

China’s economic success gives it significant global influence, and its urban population is rapidly embracing new technologies. From this perspective, the on- going trials of the digital yuan take on potentially greater importance than perhaps has been widely discussed. Few would argue that the rapid growth of China’s economy since the start of economic reforms in 1978, and especially since joining the WTO in 2001, has led to its acquiring significant global influence. As the world’s second largest economy, largest trading power and manufacturing center, China is the most important economic partner in terms of trade with over 120 countries. Also, in terms of fintech, China is arguably the world leader. The Chinese people have embraced electronic payments very quickly, seemingly unfazed by the uncertainty of the “new”. In 2019, about 580 million people in China used mobile payment methods in about 530 billion transactions, totaling about $60 trillion. These are staggering numbers, with transactions ranging from normal day- to-day purchases to trade between merchants. In addition, China’s economy has been heavily financialized during its economic recovery. China’s money supply, measured in M2, is the largest in the world at current exchange rates. In addition, China’s financial system – both formal and underground – has grown impressively; much faster than the real economy. China’s money supply is currently larger than that of the United States when measured in M2 units. As of the end of 2019, China’s M2 was the equivalent of $28 trillion versus $16 trillion in the United

States. However, despite all of the above, China is still very much tied to the dollar standard. Gold and foreign exchange reserves make up the vast majority of assets on the PBoC’s balance sheet and continue to be dominated by dollars despite some diversification.

However, the yuan faces a number of obstacles to gaining widespread acceptance as a reserve currency. The first and perhaps obvious point to note is that in order for a currency to receive reserve currency status, in the de facto sense, and not through recognition by the International Monetary Fund (IMF) through inclusion in the Special Drawing Rights (SDR), it must be available. America’s deep and liquid capital markets, lack of capital controls, and America’s past willingness to deal with current account deficits have allowed dollars to spread around the world in the same way that Latin American silver found its way across the Pacific to China, across the Atlantic to Europe and across Eurasian continent in India and beyond. China’s capital controls, the mercantilist approach to foreign exchange reserves or the accumulation of other foreign assets (such as foreign investment by state-owned enterprises), and the relatively closed and backward nature of its capital markets represent perhaps insurmountable obstacles to supplanting the US dollar as things stand. However, if the prize is deemed large enough, China may try to remove these obstacles. The challenge facing Chinese leaders is whether the free flow of accurate information and the rational self-serving behavior of market participants is compatible with the broader nature of China, led by the CPC, and its political and economic structure [16].

If digitalization increases the efficiency of transactions, this could be the driving force behind the internationalization of the yuan. Perhaps, however, this is not an all-or-nothing case. After all, the yuan could be further internationalized without crowding out the dollar completely or even substantially. While trust in the issuer of a currency

is fundamental to its success and use, especially as a store of value, this is less true as a means of payment when the parties (or one of the parties) do not intend to hold the currency for any period of time. When it comes to transactional demand for a currency, efficiency is a key variable, but when it comes to demand for savings in a currency, trust in its future value is a critical factor variable.

Bypassing SWIFT will provide attractiveness to some counterparties. In addition, different parties have very different levels of trust when it comes to choosing between RMB or USD transactions. Russia, Iran, and other countries subject to US sanctions have been seeking to phase out the SWIFT network for years, and there could well be repercussions for things like nuclear proliferation as a result of the development of a data communications system that is out of international control. The appeal of the digital yuan should also not be limited to rogue states. If the digital yuan and its payment system were to provide increased efficiency, faster settlement, and lower transaction costs with central bank clearing, potentially with payment guarantees, this could lead it to outperform the current international payment system and its associated network. instructions.

China's BRI projects and spending by Chinese tourists could be an ideal platform for introducing the digital yuan into the Eurasian economic system. China's Belt and Road Initiative (BRI) projects could be an ideal testing ground for the internationalization of the digital yuan. With so many state-owned companies involved in supplying materials, executing construction and financing infrastructure development, not to mention Chinese workers living and spending money along the New Silk Road, the potential for creating a BRI-linked digital yuan economic system is clear. The result, especially in countries whose national currencies enjoy limited credibility, could be the beginning of a yuan bloc. In addition, the eco- nomic benefit of Chinese tourists using digital yuan while on holiday abroad may well encourage merchants in other countries to accept digital yuan as a means of payment [17].

Efficiency can promote trade; bifurcation may prevent this. The impact on global trade as a whole may be mixed. Competition in the international payment infrastructure may well lead to rapid innovation and efficiency gains. This, in turn, could reduce the influence of national borders on the restriction of trade in goods and services, eliminating the uncertainty in payments and facilitating the expansion of exchange. Similarly, bifurcation of standards, especially when developing parallel systems that are not cross-compatible, can lead to inefficiencies. This would lead to the division of the world into spheres of influence, delimited by the use of currency, which would limit the gains from trade [18].

Conclusions: during our research, we found it important to pay attention to future developments related to DCEP for two reasons. First, depending on how the system is developed domestically, DCEP could change the competitive structure of the Chinese mobile payment market and the revenue structure of private payment service providers. Vice Chairman of the People's Bank of China Fan suggested in a 2020 paper that the central bank would bear the costs incurred by large state-owned commercial banks providing "public goods" such as DCEP conversion and opening wallets. If support from the People's Bank of China results in the elimination of DCEP fees, private payment service providers may be forced to waive their fees or reduce related costs. In

other countries, if the design of the system were to benefit large state-owned commercial banks and disadvantage private payment service providers, it would be criticized as oppression of the private sector. However, a similar system design is possible in China, where the economic structure is controlled by the state. The second reason is that internationally, Chinese model CBDCs could spread to other developing countries in a step-by-step effect if DCEP can overcome technological challenges and is found to be effective in solving problems such as improving the security and convenience of payments and expanding access to financial resources encountered by developing countries. If China creates a mechanism and technology for CBDC that can be applied in other developing countries, then e-CNY may be able to take the lead globally while other countries, especially developing countries, consider introducing CBDC. in future. However, due to technological superiority alone, the Chinese CBDC model will not necessarily be adopted by developing countries. While DCEP may spread to some extent in China, issues such as protecting privacy and focusing on the public sector can only be addressed through China's state- owned economic system. Moreover, the introduction of the Chinese CBDC model in these countries could also lead to a deterioration in these countries' relations with the US, as financial and technological conflicts between the US and China continue to deepen. Of course, there are risks, not least the potential vulnerability of the technology. However, assuming the platform is reliable, the key risk is the unintended consequences of disrupting the financial system. China's decision to operate through commercial banks and the fact that the official financial system is in any case dominated by state institutions greatly reduce these risks for China. Efficiency gains from a cheap and fast settlement system could potentially provide economic recovery at a time when the economy is facing secular forces causing stagnation, but the "cost" is the loss of individual anonymity and the transfer of more control to the state. These costs are, of course, within the field of view of the observer.

Internationally, the digitization of the yuan has the potential to accelerate the use of the Chinese currency in international transactions if the payment system outperforms the existing infrastructure. BRIM and the Chinese tourists traveling through the region present an excellent opportunity for China to promote the digital yuan to neighboring countries. Bypassing SWIFT will appeal to those seeking to avoid scrutiny by the OECD and could limit the effectiveness of economic sanctions against security threats. In many ways, a competing international currency will underscore the arrival of a bipolar world and could accelerate the denouement that is already underway

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INVESTMENTS FOR ADULT STUDENTS AS AN EFFECTIVE WAY TO EARN EXTRA EARNINGS

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Abstract. The article exposes the reasons for learning to invest as early as possible, the steps involved in preparing to start investing on your own, and the advantages of investing for adult students to earn extra money.

Keywords: investments, investment education, advantages of investing, income, capital.

ИНВЕСТИЦИИ ДЛЯ СОВЕРШЕННОЛЕТНИХ ОБУЧАЮЩИХСЯ КАК ЭФФЕКТИВНЫЙ СПОСОБ ДОПОЛНИТЕЛЬНОГО ЗАРАБОТКА

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Аннотация. В статье рассмотрены причины, по которым нужно учиться инвестировать как можно раньше, этапы подготовки к началу самостоятельного вложения средств, а также выгоды инвестирования для совершеннолетних обучающихся с целью дополнительного заработка.

Ключевые слова: вложения, обучение инвестициям, достоинства инвестирования, доход, капитал.

Why do students start earning money? Should students work?

The desire to earn money and feel like an adult comes from school. However, it is often difficult for minors to find opportunities to earn serious money with their own labor.

Some of them concentrate all their time at college or university on acquiring knowledge, some do not get a job until their third or fourth year, and some start looking

for work in their first year of study. There are a few reasons why young people start looking for a job already in the first year: the first is desire to try something new or uncertainty about the future, but mostly it's a lack of money, as one scholarship is definitely not enough to live on, especially in cities like Saint Petersburg, Moscow, Kazan etc. So, what awaits a student who decides to combine study and work? Lack of free time because of the busy schedule, conflicts with managers and emotional burnout. And most often it is a question of low-paying and not very prestigious positions. Is it worth wasting the time meant to enjoy student life on such activities, or is it better to wait until graduation?

Investing as the way to earn extra money

For everyone who wants to determine their future and present financial situation, knowing how to invest is a must-have skill. Anyone can learn how to invest their funds profitably. It may be a bank deposit or realty, but inflation is unavoidable – the purchasing power of money will reduce, and you will be able to buy less and less with the same amount each year. To protect yourself against inflation, you can invest your money and earn extra money – passive income. In addition to create a financial reserve or saving for something, passive income is not only one of the goals of investors, but also one of the main benefits of investments.

What is investment and how to start investing

We are meeting an information about investments every day, but many people still don't understand what is it.

Investments are long-term contributions of monetary capital in order to preserve and increase it. The objects of investment can be securities, real estate, precious metals, currency etc. [1, p. 60].

There are investments made by the State (the State invests), corporations (business invests) and also investments made by individuals – personal investments which allow them to augment their finances and earn a passive income.

Also, investments can be financial (buying securities, investing money in a business for a long or short term) and investments in real assets. They can be tangible (for example, the purchase of equipment) and intangible (patents, scientific developments, etc.) [2, p. 130].

There are 6 types of investment assets:

1. Currency. This is the most liquid asset. The currencies of developed countries are more stable than the currencies of developing countries, so they often become a safe haven asset on the eve of a crisis: before a crisis, investors sell rubles and buy dollars. Negative – the currency is subject to inflation.

2. Deposits and bonds. These are fixed-income and low-risk instruments.

3. Stocks. The most profitable asset that allows you to invest in thousands of companies from different sectors. When buying shares, the investor actually buys a part of the company. But he does not need to spend time on management: he only shares the successes and failures of the company in proportion to his share.

4. Realty. This is the tangible property owned by the investor: land, commercial and residential premises. This asset is protected from inflation: housing costs and rents are rising along with the overall price level.

5. Commodity. These are commonly used goods: oil, silver, gold, millet, pork, paper and coffee. These tangible assets protect capital from inflation [2, p. 200].

Assets are characterized by the following criteria:

1. Profitability (calculated as a percentage per annum)

2. Degree of risk (decrease in asset price, any profitability carries a corresponding risk)

3. The complexity of the choice (the more variables have to be taken into account, the more difficult it is to choose an investment object)

4. Liquidity (shows how quickly you can buy or sell an asset. For example, a one-room apartment near the metro in Moscow will be bought faster than a three-room apartment in Vorkuta) [3, p. 89].

The aim of investment

Investment is a way of making a profit. Investments are made by those who wish to increase their income. The level of profitability and risk depends on where you invest your money.

It is therefore better to prepare for investing. There are a few things you should do before you make your first purchase on the stock exchange:

1. Be clear about the purpose of investing. As mentioned earlier, this could be to save up for something or to generate passive income.

2. Pay off all loans and pay off all debts. In addition, it’s better not to invest money you have borrowed, until you get necessary experience.

3. Create a cash reserve in case you lose your sources of income. It should provide you not less than 3-6 months of normal life period, and should be hold in a safe place, such as a bank deposit.

4. Determine the starting amount for your investment.

5. To set up your risk limits.

6. Get some basic investment knowledge.

Why should students learn about how to invest?

Not too many young people think about starting to invest at the age of 18-20. However, this is the most appropriate age to learn how to invest. Most people are of the opinion that you need a considerable start-up capital to make a profit. However, you can find securities on the stock exchange equivalent 10 rubles!

Here are some reasons why a student should study investment:

1. To accumulate minimum capital. If throughout the years of study, the student invests and earns at least a minimal passive income, by graduation he will be able to accumulate funds that will help him in the start of his adult life.

2. Building financial literacy. Saving a portion of your income for investments on a regular basis develops responsibility in dealing with money and financial planning skills [4, p. 386].

Most importantly, as a student, you need to gain experience, collect information and learn the basics of investing so that as an independent adult you will be able to get serious about investing. It is better to learn how to invest with a small amount of capital that you are not afraid to lose.

Those who do not recommend investing small amounts are partially right: there will be no significant effect, at least in the first years. Instead of investing in securities,

it is usually advised to invest as much as possible in self-development, raise the level of income, and then invest large sums. It will be easier to accumulate large capital this way.

However, this approach has serious disadvantages. For example, the effect of compound interest is not taken into account, and the longer you invest in securities, the more money you will eventually receive [4, p. 423].

The main thing is to do it regularly; in this way, the student will develop the useful habit of systematically investing some capital. However, in order to solidify knowledge, they must be applied, that is, practice is needed. Personal experience is extremely important. Even if the first investment turns out to be ill-considered and results in a loss, it will give you an insight into how investments in securities work. It is better to lose a small part of your capital at the start, when there is still plenty of time to spare, than to lose part of a big sum later.

Benefits of investing for adult students

1. Establishing a culture of savings. Saving money can be used to ensure your financial well-being or to save up for a major purchase. Investing creates a culture of saving, because you must set aside a part of your income for it. Further, as income increases, the standard of living gradually increases and at the same time the amounts that are invested increase. A person thinking about saving expects much more financial success than someone who spends all of their income.

2. The compound of interest mechanism. The profitability of any investor depends not only on the start-up amount, but also on two important factors: the returns and the time horizon. Long investment positions as usually show more stable return, and better result. A compound interest helps an investor earn more, because the investor does not spend the profits but reinvests them, thereby increasing the amount to which the interest accrues [5, p. 27].

3. In the process of investing, it is possible to earn income without considerable effort. All you need to do is to choose the object to invest according to available capital

4. Profit is not limited. It is always possible to grow and earn more.

5. It is possible to secure the capital and protect it from inflation, provided that skill investments are made.

6. Increases financial literacy, experience, knowledge, expanding horizons, therefore, acquire new contacts, which later can help to get a good job.

7. The possibility of self-fulfillment and personal goals, there are no restrictions in action

Conclusion: the research done on investments for adult learners leads to the following conclusions:

1. To protect one's capital from inflation, knowing how to invest is a must-have skill, and the student years are the best time to learn this skill.

2. Regular investing is an effective way of earning extra income, as income depends only on the investor's efforts, awareness and experience; it builds a savings culture, increases financial literacy, broadens the mind and provides opportunities for self-realization.

3. Investments are available to everyone because the economy and finances are simpler than they seem at first sight.

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PROBLEMS AND PROSPECTS OF CULTURAL IDENTITY DEVELOPMENT IN THE MODERN WORLD

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Abstract. This article examines aspects of the development of cultural identity in the era of globalization, also characterizes the process of globalization and its impact from the point of view of the works of various scientists. The modern world poses challenges to society not only of a technological plan, but also of a cultural one. Will humanity cope with the solution of this situation, the question remains open.

Keywords: problems, prospects, globalization, culture, cultural identity, the modern world.

ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ КУЛЬТУРНОЙ ИДЕНТИЧНОСТИ В СОВРЕМЕННОМ МИРЕ

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Аннотация. В статье рассматриваются аспекты развития культурной идентичности в эпоху глобализации, также характеризуется процесс глобализации и его влияние с точки зрения трудов различных ученых. Современный мир ставит задачи перед обществом не только технологического плана, но и культурного. Справится ли человечество с решением данной ситуации? – вопрос остается открытым.

Ключевые слова: проблемы, перспективы, глобализация, культура, культурная идентичность, современный мир.

In the modern world, it is becoming increasingly difficult to determine who a person is? What culture does he belong to, what does he profess and what does he face in the outside world? This is all connected with the processes of erasing borders between states, or, as scientists say, globalization.

Globalization is now affecting all spheres of human life, including cultural. Culture- appeared with human activity and always helped in the initial stages to determine what a person is.

The national culture is unique, and is formed based on the history of a particular people. A person has always been identified in the culture. For example, the fact that you are Italian helps to understand your expressiveness with your movements when

talking, the fact that you are German, your punctuality, that Japanese is your closeness, etc. The main factor- is language, it gives out belonging to culture at once. Although in the modern world the role of language ceases to be a priority. And this is also due to the development of modern technologies.

People more often began to abandon their self, their belonging to any culture, which began to depersonalize a person. Unfortunately, this trend is gaining momentum and is being adopted by the leading countries of the West. But, there are also those who, in fear of losing their cultural code, refuse to follow this path together with everyone. For example, the United Kingdom withdrew from the European Union. One of the reasons was Europe's acceptance of refugees from all over the world. The United Kingdom still continues to accept refugees, however, having reduced their number. According to British politicians and scientists, refugees and the indigenous population cannot live as one – a whole society. Therefore, entry was restricted so that none of them would have to lose their cultural identity until it became clear what could be done in this situation.

The loss of a person's cultural identity is one of the most important problems of globalization. If humanity still cannot solve it, then the theory of the swimming boiler will become a reality.

The modern world is experiencing crises in all directions of its existence. The socio-cultural component has also reached a dead end and is forced to adapt to the harsh modern realities. In the world of globalization and the breakthrough of scientific technology, it is still dangerous to identify yourself as a representative of a particular culture. Society is evolving every year, but the fear of talking about one's belonging is increasing.

The main factor influencing the development of cultural identity now is globalization. Globalization is a process that encompasses all spheres of society and brings them together. This process is the main problem of the development of cultural identity in the modern world. The spectrum of influence of globalization includes culture too. When following this trend, the world is on the verge of erasing cultural boundaries and merging into a single common. We can talk about both a positive influence and a negative one. For example, if cultural borders are erased, ethnic wars and genocides in the world will cease, since everyone will consider themselves representatives of the same society. However, the historical memory of the origin of its own culture will cease to exist, as it will not be passed down from generation to generation.

Cultural identity is formed in the process of adopting one's own cultural code, understanding differences from others. It follows from this that globalization is a problem for the further development of cultural identity. Behavior, values, language, morals, foundations – all these factors will be erased with the full penetration of globalization into culture. Then people will no longer differ in their national code, but will simply become one single nation.

When referring to certain cultural groups, a person feels safer, can know himself and answer the question, who is he? After all, if the profession, place of residence, surname, and even name can be changed, then nationality will always identify you.

Let's consider both positive and negative factors of the influence of globalization:

The positive ones include the fact that globalization erases cultural boundaries, thereby contributing to their enrichment and mutual exchange, while not necessarily losing its identity, but it will already be a secondary factor. With the advent of technology in the sphere of culture, it has become more accessible and adapted to the communications of various representatives. E. Giddens, for example, argues that the goal of globalization is to lead society to cultural pluralism [1]. According to Giddens, culture is becoming more widespread and accessible thanks to the introduction of modern technologies into it. Now culture can be accessible to absolutely everyone, regardless of gender, age and social affiliation. Culture is becoming more open to exchange, which helps countries to build their political views and preferences more flexibly on the world stage.

The negative factors include the formation of culture as a more commercial product. T. Adorno and M. Horkheimer were the first in their writings to highlight in a negative way the formation of mass culture due to the influence of globalization [2]. T. Adorno wrote that the more culture becomes a universal concept, the more it is only American. Since America is considered the main engine of globalization, mass culture is also produced by them. For example, Disney took over the monopolization of children's cartoons. M. Horkheimer denied the voluntary synthesis of cultures, saying that American globalization forces this process.

M. Foucault [3]. also spoke in a negative way about the impact of globalization. Culture, according to Foucault, is a historical phenomenon proceeding from the origins of humanity, and globalization is an artificially created process for the control and subordination of society. Culture, as an organic phenomenon, cannot obey synthetic processes. The same point of view was held by G. Deborah [4], J. F. Lyotara [5] and J. Baudrillard [6].

It is impossible to deny the positive impact of globalization in the field of mass culture, but the process of interconnectedness of cultures leads to their opposite- mutual invulnerability. It can lead to the disappearance of cultures, and as a consequence, identity.

S. Huntington speaks about the problem of preserving cultures in the era of globalization [7]. Along with the mass character and accessibility, it is impossible to lose the historical thread of its origin. Huntington also noted that it is dangerous to establish universals – this will lead to a clash of civilizations. Americanization or Westernization will not be able to take root in all corners of the world, due to the great difference from other cultures. Globalization also leads to the fact that the mass media propagandize new cultural trends. Huntington talks about multiculturalism that emerged in Europe in the late 1990s. All immigrants have the right to self-determination and the preservation of their cultural identity, which is radically different from the concept of a "melting pot" in the United States. If globalization should be introduced into culture, then only with the help of multiculturalism.

Within the framework of multiculturalism, the preservation of cultural identity is possible. For example, the government of European countries gives its refugees the

opportunity to learn their native language and practice their religion. Multiculturalism also carries with it the imposition of tolerance on the indigenous population.

The influence of multiculturalism also has a detrimental effect on the development of cultural identity. For example, refugees who come to Europe mainly from Muslim countries, bringing with them completely different cultural values. The majority of Europeans are Christians, so the indigenous population faces difficulties of acceptance.

If earlier the majority of European countries and politicians considered multiculturalism to be the fundamental concept for the development of culture in Europe, now many people express radically the opposite.

For example, the previous German Chancellor, Angela Merkel, condemned multiculturalism for creating isolation and separation of communities in German society. Living in the same space, Muslims and Christians in Germany do not interact with each other as representatives of a single society. Former British Prime Minister David Cameron was absolutely in solidarity with his German counterpart. Speaking in Munich in 2011, he expressed concern that the British do not have a unified civil society. Cameron also noted the problem of different vectors of development of civic culture and national culture, in a healthy society, they should develop together.

Former French President Nicolas Sarkozy described the current multiculturalism in Europe as a failure of the principles of civic integration. French society also consists of various communities, which at the same time do not interact with each other in any way. Thus, the fate of multiculturalism in Europe remains unknown.

As for the prospects for the development of cultural identity, they remain unclear. Of all the ways of development, you need to choose the one that will suffer the least amount of losses. For example, Amartya Sen proposed to develop a new concept of "individual freedom and cultural choice" [8]. Amartya Sen believes that ethnic traditions are mostly imposed on a person, having been born a representative of a certain nationality, he has no choice with whom to identify himself. This fact affects the incorrect formation of cultural identity. Therefore, he suggests loosening the policy of promoting group norms and giving free rein to individual choice. Amartya Sen describes cultural freedom as a person's choice of the realities that suit him, that is, to make decisions for himself how to build his cultural identity.

Based on all of the above, it is worth concluding that cultural identity in the modern world faces problems that are associated with the processes of globalization. While there is a prospect of development, however, it all depends on which concept of cultural development countries will adhere to. Will it be important to preserve your identity in the future? Or should you not be different from representatives of other cultures and need to become one? Only time can answer these questions.

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TECHNICAL BARRIERS AND RISKS OF CLOUD COMPUTING

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Abstract. In this paper, the following are considered: a modern model in which users are provided with computing resources via the Internet; The most up-to-date cloud computing information risks associated with them, as well as methods of protection.

Keywords: cloud, cloud computing, hypervisor, virtual machine.

ТЕХНИЧЕСКИЕ БАРЬЕРЫ И РИСКИ ПРИМЕНЕНИЯ ОБЛАЧНЫХ ВЫЧИСЛЕНИЙ

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Аннотация. В данной статье рассматриваются: современная модель, в которой пользователям предоставляются вычислительные ресурсы через Интернет; наиболее актуальные информационные риски облачных вычислений, связанные с ними, а также методы защиты.

Ключевые слова: облако, облачные вычисления, гипервизор, виртуальная машина.

At present, cloud computing represents a model for providing users with convenient network access to a shared pool of configurable computing resources (servers, applications, databases, services, etc.) on demand. At the same time, all these resources are located on a remote server and do not require a constant increase in storage, and their response is almost instantaneous: the speed of downloading and uploading is proportional to the speed of the Internet on the laptop used, because nothing more is required to obtain all the necessary materials [1, p. 212]. The user

always receives the necessary resources in seconds, there is no need to wait for the delivery and installation of devices, moreover, he pays only for the resources that he actually uses, and never overpays (Figure 1; Figure 2).

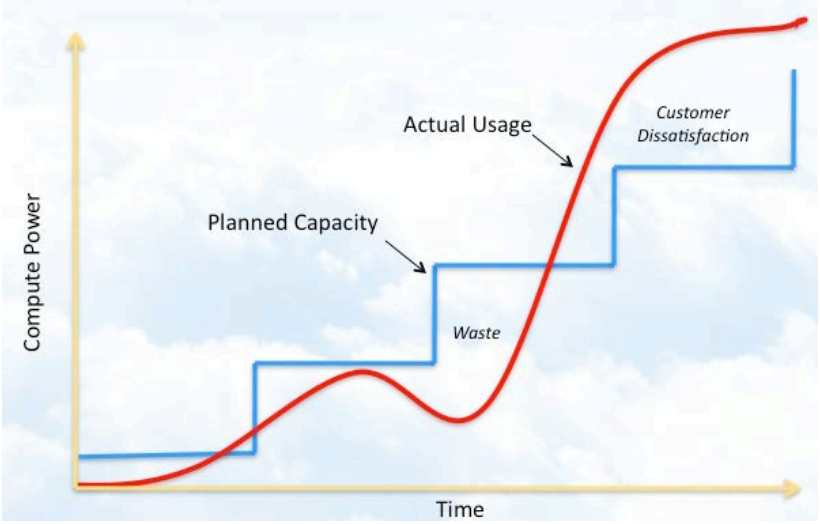


Figure 1. Traditional data center

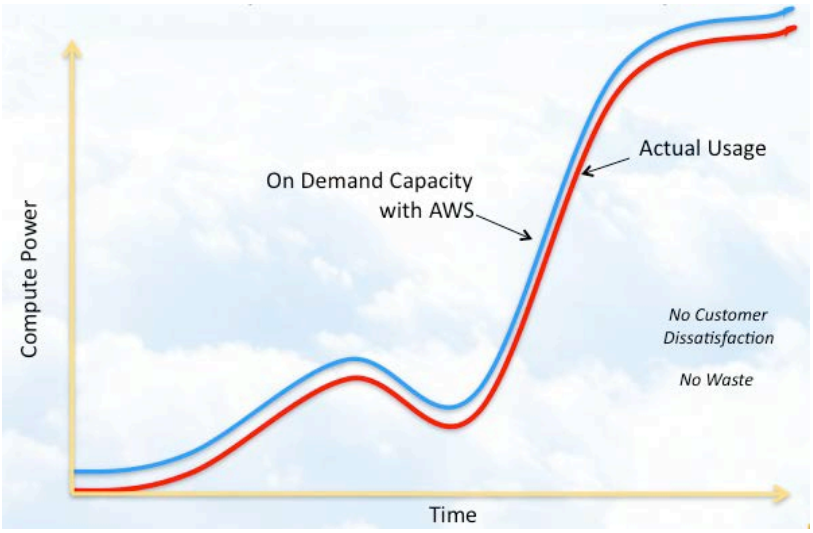


Figure 2. Cloud infrastructure

Three main types of cloud technology:

1. Private cloud: a cloud computing model with infrastructure for a limited number of users. Often, the cloud with such network access can only be used by employees of the company to which it belongs, or less often – its customers. Such an IT infrastructure can be located in both its user and operator. An example of this type of cloud technology is Amazon's private cloud (Amazon VPC).

2. Public cloud: the same cloud computing model with infrastructure, only designed for and adapted to the mass user. Users can't manage the public cloud, they can only use it. Examples of this type of cloud technologies are Amazon Web Services (EC2 and S3), Google Apps/Docs.

3. Hybrid cloud: a cloud computing environment that combines both of the above types of cloud technologies (private and public). It is used in companies with seasonal fluctuations in activity: when the number of requests reaches its peak, part of the capacity is transferred to the public cloud. Part of the client data can be stored on the company's own server, the other part on the provider's server.

Cloud Computing is special applications for performing certain operations and a common pool of remote computing resources (Figure 3). Cloud Computing is a workspace on a remote server [2, p. 117]. Examples of cloud computing: Elastic Compute Cloud (EC2) service from Amazon, G Suite (Google Apps).

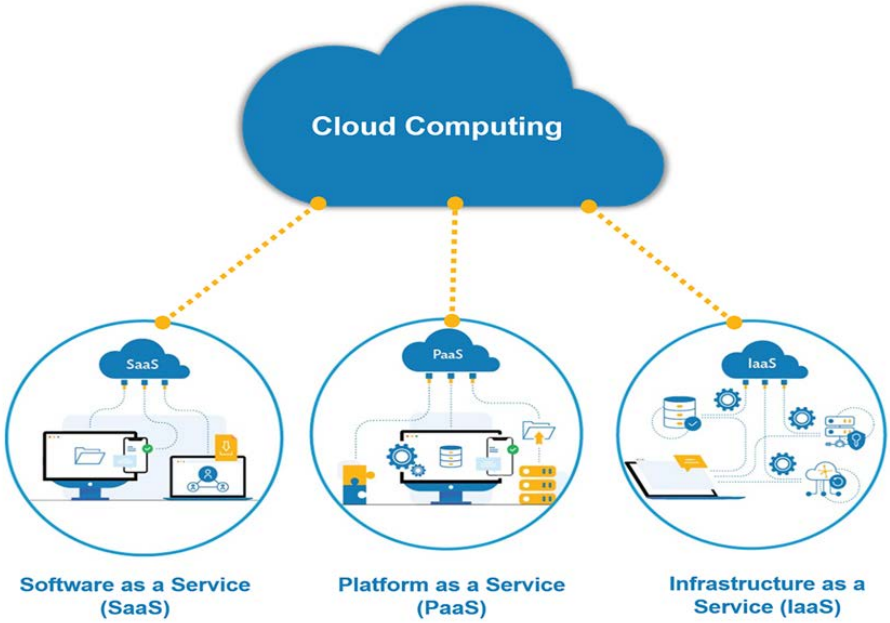


Figure 3. Types of cloud computing

In cloud computing, all resources are located on a remote server and do not require a constant increase in storage, and their response is almost instantaneous: the speed of downloading and shipping is proportional to the speed of the Internet on your laptop, because you do not need anything else to get all the necessary materials. It is also impossible not to pay attention to the economic side of this method of storing and using data – there is no need to rent or buy a room and make repairs for its further operation, buy all the necessary equipment and hire workers for maintenance and protection [3].

With cloud computing, data is transformed. Cloud computing technologies require more computing power and are mainly for businesses.

But is everything so "cloudy"? Despite the advantages, the very concept of cloud technologies is criticized a lot, and from a variety of angles:

− "Cloud" is a data warehouse, which in one way or another has vulnerabilities, using which, attackers can gain access to the entire storage system.

− The flexibility of software configuration does not always allow you to customize the system for your own needs.

− The loss of information in the "cloud" means the impossibility of its recovery.

− To create your own cloud, you need to allocate a considerable amount of material resources.

The last item on this list is not the last in importance, because, when it is moved to the cloud, some control over files and personal data is automatically lost, albeit not all, but partial control over files and personal data.

In cloud computing, virtualization technology plays a critical role as a platform. Among the known threats to cloud computing is the difficulty of moving cloud servers to the compute cloud [4]. In most traditional data centers, engineers' access to servers is controlled at the physical level; in cloud computing, they work over the Internet. Therefore, differentiating access control and ensuring transparency of changes at the system level is a major protection criterion.

The threat can be related to the dynamism of virtual machines. Virtual machines are cloned and can be moved between physical servers. This variability affects the design of holistic security. Meanwhile, operating system or application vulnerabilities in a virtual environment spread unchecked and often manifest themselves after an arbitrary period of time, such as when restoring from a backup. Therefore, in a cloud computing environment, it is important to reliably capture the security state of a system, regardless of its location. The risk of hacking and malware infection is quite high for cloud and virtualized systems. Therefore, an intrusion detection and prevention system must be able to detect malicious activity at the virtual machine level, regardless of its location in the cloud environment.

A shutdown virtual machine is also at risk of infection, since network access to its image repository is sufficient. At the same time, it is impossible to enable protection software on a shutdown virtual machine. That is why protection must be implemented at the hypervisor level [5, p. 59]. You should also keep in mind that with cloud computing, the network perimeter is blurred or even disappears, which leads to a completely different definition of the overall level of network security. It corresponds to the least secure part of the network.

So-called client attacks can be distinguished. Since most users connect to the cloud using a browser, there is a risk of password hijacking, web session hijacking, and many other such attacks. The only protection against them is proper authentication and the use of an encrypted connection (SSL) with mutual authentication. However, these defenses are not very convenient and are very wasteful for cloud creators. There are still a lot of unresolved problems in this area of information security.

One of the key elements of a virtual system is the hypervisor. Its main function is to share resources between virtual machines. An attack on the hypervisor can allow one virtual machine to access the memory and resources of another. It will also be able to intercept network traffic, take away physical resources, and even force a virtual machine off the server.

Security threats always give rise to solutions that can prevent them. Which are the most effective? One of the most effective ways to protect data is through encryption. The provider providing access to the data should encrypt customer information stored in the data center and, if not necessary, irretrievably delete it. In transmission, even encrypted data should only be available after authentication. In addition, data should only be accessed via secure AES, TLS, and IPsec protocols. The

use of tokens and certificates for authentication will also improve security. It is also recommended to use LDAP (Lightweight Directory Access Protocol) and SAML (Security Assertion Markup Language) for transparent interaction between the provider and the authentication system [6, p. 332].

In conclusion, I would like to say that there are many disadvantages in cloud technologies, but compared to the advantages that they offer, and with the rapid growth of IT technologies, they will be popular with users. Ridding yourself of the need to buy new computers to ensure high performance, from the difficulties in setting up complex systems and buying expensive software - all this will allow you to positively develop cloud technologies in the future.

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INVESTIGATIONS OF THE COMPUTATION TIME OF LEGENDRE POLYNOMIALS REPRESENTED BY THE ASYMPTOTIC FORMULA

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Abstract. The article presents a comparative analysis of the time spent for calculations by a digital computer of Legendre polynomials expressed by classical and asymptotic formulas. 16 polynomials were selected for research. Calculations are performed for 100 implementations of a cycle of 1000 mathematical operations. Fragments of the software implementation of this method in the Pascal programming language are presented.

Keywords: Legendre polynomial, asymptotic formula, mathematical operation, digital computer, optoelectronic system.

ИССЛЕДОВАНИЯ ВРЕМЕНИ ВЫЧИСЛЕНИЯ ПОЛИНОМОВ ЛЕЖАНДРА, ПРЕДСТАВЛЕННЫХ АСИМПТОТИЧЕСКОЙ ФОРМУЛОЙ

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Аннотация. В статье приведен сравнительный анализ времени, затрачиваемого для расчетов цифровой вычислительной машиной полиномов Лежандра, выраженных классической и асимптотической формулами. Для исследований выбраны 16 полиномов. Вычисления выполняются для 100 реализаций цикла из 1000 математических операций. Представлены фрагменты программной реализации данного способа на языке программирования Pascal.

Ключевые слова: полином Лежандра, асимптотическая формула, математическая операция, цифровая вычислительная машина, оптико-электронная система.

The classical Legendre polynomial formula has the form [1, p. 673]:

$$P_n(x) = \frac{1}{2^n \cdot n!} \cdot \frac{d^n}{dx^n}[(x^2 - 1)^n]. \quad (1)$$

Consider a particular problem for n = 2...16 and present the formula (1) for these polynomials:

$$P_2(X) = \frac{1}{2}(3X^2 - 1);$$
$$P_3(X) = \frac{1}{2}(5X^3 - 3X);$$
$$P_4(X) = \frac{1}{8}(35X^4 - 30X^2 + 3);$$
$$P_5(X) = \frac{1}{8}(63X^5 - 70X^3 + 15X);$$
$$P_6(X) = \frac{1}{16}(231X^6 - 315X^4 + 105X^2 - 5);$$
$$P_7(X) = \frac{1}{16}(429X^7 - 693X^5 + 315X^3 - 35X);$$
$$P_8(X) = \frac{1}{128}(6435X^8 - 12012X^6 + 6930X^4 - 1260X^2 + 35);$$
$$P_9(X) = \frac{1}{128}(12155X^9 - 25740X^7 + 18018X^5 - 4620X^3 + 315X);$$
$$P_{10}(X) = \frac{1}{256}(46189X^{10} - 109395X^8 + 90090X^6 - 30030X^4 + 3465X^2 - 63);$$
$$P_{11}(X) = \frac{1}{256}(88179X^{11} - 230945X^9 + 218790X^7 - 90090X^5 + 15015X^3 - -693X);$$
$$P_{12}(X) = \frac{1}{1024}(676039X^{12} - 1939938X^{10} + 2078505X^8 - 1021020X^6 + +225225X^4 - 18018X^2 + 231);$$
$$P_{13}(X) = \frac{1}{1024}(1300075X^{13} - 2124694X^{11} + 4849845X^9 - 2771340X^7 + +765765X^5 - 90090X^3 + 3003X);$$
$$P_{14}(X) = \frac{1}{2048}(5014575X^{14} - 16900975X^{12} + 22309287X^{10} - 14549535X^8 + +4849845X^6 - 765765X^4 + 45045X^2 - 429);$$
$$P_{15}(X) = \frac{1}{2048}(9694845X^{15} - 35102025X^{13} + 50702925X^{11} - 37182145X^9 + +14549535X^7 - 2909907X^5 + 255255X^3 - 6435X);$$
$$P_{16}(X) = \frac{1}{32768}(300540195X^{16} - 1163381400X^{14} + 1825305300X^{12} - -1487285800X^{10} + 669278610X^8 - 162954792X^6 + 19399380X^4 - -875160X^2 + 6435).$$

From the above formulas, it can be concluded that the calculation of Legendre polynomials, represented by the classical formula, is a rather laborious process that requires large resources of a digital computer (digital computer) used, for example, in optoelectronic image recognition systems for both civilian and military purposes.
To simplify calculations, asymptotic formulas are used, for example, in [2, p. 212, p. 222]:

$$P_n(\cos(\theta)) = \sqrt{\frac{2}{n \cdot \pi \cdot \sin(\theta)}} \cdot \sin\left(\left(n + \frac{1}{2}\right) \cdot \theta + \frac{\pi}{4}\right). \quad (2)$$

In this case, the polynomials will have a more simplified form:

$$P_2(\cos(\theta)) = \sqrt{\frac{1}{\pi\cdot\sin(\theta)}}\cdot\sin(2\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_3(\cos(\theta)) = \sqrt{\frac{2}{3\cdot\pi\cdot\sin(\theta)}}\cdot\sin(3\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_4(\cos(\theta)) = \sqrt{\frac{1}{2\cdot\pi\cdot\sin(\theta)}}\cdot\sin(4\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_5(\cos(\theta)) = \sqrt{\frac{2}{5\cdot\pi\cdot\sin(\theta)}}\cdot\sin(5\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_6(\cos(\theta)) = \sqrt{\frac{1}{3\cdot\pi\cdot\sin(\theta)}}\cdot\sin(6\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_7(\cos(\theta)) = \sqrt{\frac{2}{7\cdot\pi\cdot\sin(\theta)}}\cdot\sin(7\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_8(\cos(\theta)) = \sqrt{\frac{1}{4\cdot\pi\cdot\sin(\theta)}}\cdot\sin(8\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_9(\cos(\theta)) = \sqrt{\frac{2}{9\cdot\pi\cdot\sin(\theta)}}\cdot\sin(9\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{10}(\cos(\theta)) = \sqrt{\frac{1}{5\cdot\pi\cdot\sin(\theta)}}\cdot\sin(10\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{11}(\cos(\theta)) = \sqrt{\frac{2}{11\cdot\pi\cdot\sin(\theta)}}\cdot\sin(11\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{12}(\cos(\theta)) = \sqrt{\frac{1}{6\cdot\pi\cdot\sin(\theta)}}\cdot\sin(12\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{13}(\cos(\theta)) = \sqrt{\frac{2}{13\cdot\pi\cdot\sin(\theta)}}\cdot\sin(13\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{14}(\cos(\theta)) = \sqrt{\frac{1}{7\cdot\pi\cdot\sin(\theta)}}\cdot\sin(14\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{15}(\cos(\theta)) = \sqrt{\frac{2}{15\cdot\pi\cdot\sin(\theta)}}\cdot\sin(15\frac{1}{2}\cdot\theta+\frac{\pi}{4});$$
$$P_{16}(\cos(\theta)) = \sqrt{\frac{1}{8\cdot\pi\cdot\sin(\theta)}}\cdot\sin(16\frac{1}{2}\cdot\theta+\frac{\pi}{4}).$$

Problem statement

To fix the time (in milliseconds) spent by the CVM when calculating Legendre polynomials represented by classical and asymptotic formulas. Perform calculations for 100 implementations of a cycle of 1000 mathematical calculations of polynomials. To draw a conclusion about the temporary effectiveness of using both methods.

Software implementation

The solution of the task is implemented in the Pascal programming language in the Delphi 6.0 object-oriented programming environment [3]. To protect copyrights and prevent copying of the developed program, it is advisable to use the methods described in [4; 5].

After launching the executable file, the main window of the program appears on the screen of the personal computer (PC), shown in figure 1.

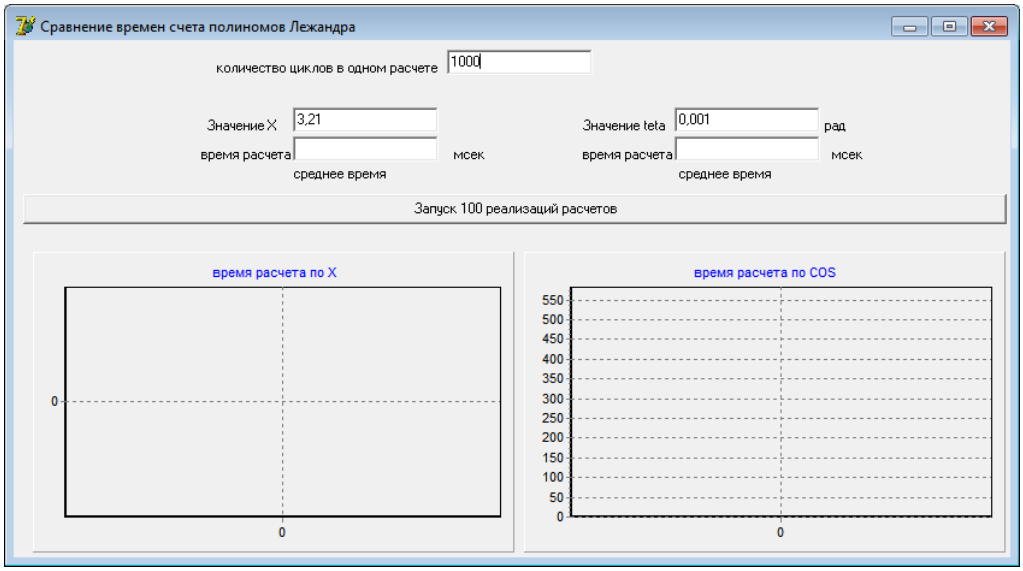


Figure 1. Appearance of the main program window

The values X and Θ are chosen as the initial data, such that the calculated polynomials will be equal. In this case, the experiments will be independent and homogeneous.

After clicking the "Start 100 implementations of calculations" button, calculations are performed. The program operation is accompanied by the flashing of the output cell of the calculation time of 1000 cycles, as well as the output of this time and the average time for one implementation on the graph (Figure 2).

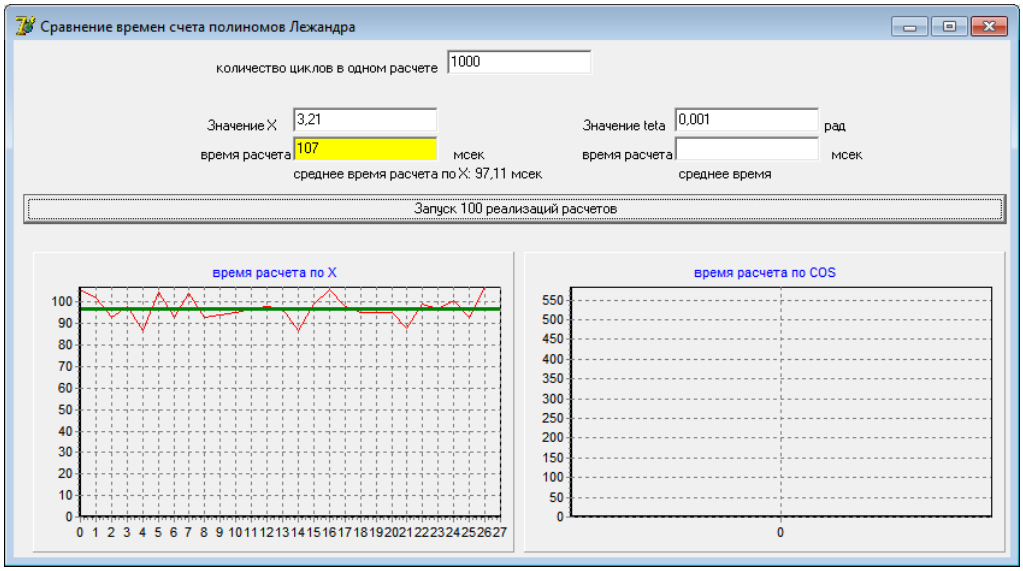


Figure 2. The moment of the program operation

After all calculations are performed, the graphs show the times of 100 implementations, the average time of their execution, and in the header of the main form a conclusion is formulated about the effectiveness of calculations according to the formulas presented above (Figure 3).

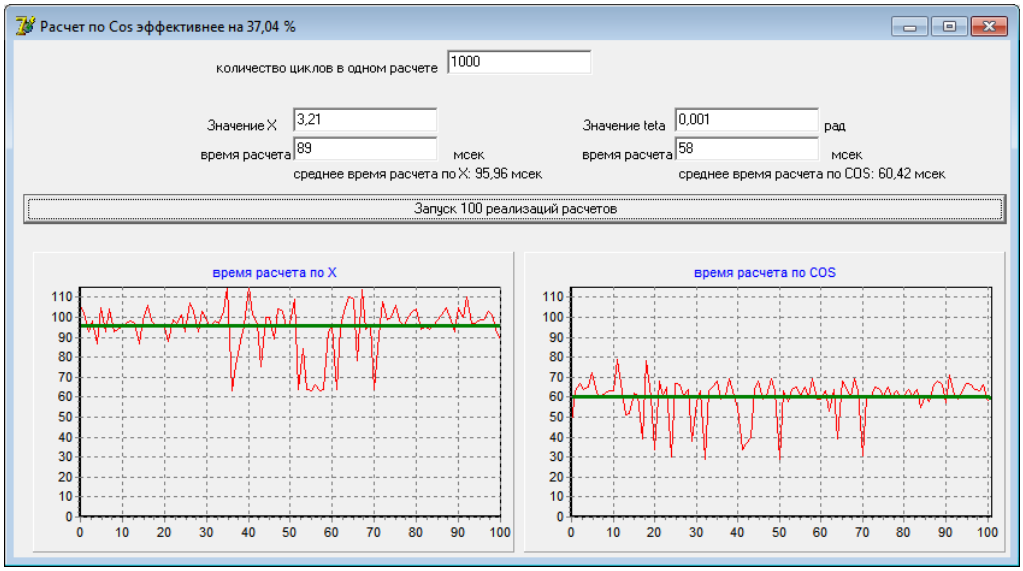


Figure 3. The end of the program

The study was conducted on a PC (the results are shown in Table 1) based on an Intel(R) Pentium(R) CPU G4600 @ 3.60 GHz, 8.0 GB RAM, 64-bit Windows 7 operating system. For five program launches (line "Launch No."), the calculation times were fixed (line "*tsred*") according to the classical formula (row "Formula", column "cl.") and asymptotic (row "Formula", column "asym."). The line "Effect." shows the calculation of the effectiveness of the time parameter as a percentage.

Table 1 – Legendre polynomial counting times

Launch No.	1		2		3		4		5	
Formula	cl.	asym.	cl.	asym.	cl.	asym.	cl.	asym.	cl.	асим.
tsred, ms	95,96	60,42	97,81	62,26	91,09	58,84	94,16	58,81	94,5	60,21
Effect.	37,04		36,32		35,4		37,54		36,29	

Based on the results of the performed studies, it can be concluded that the use in practice of calculations of Legendre polynomials on any digital computer, including those with low speed, using asymptotic formulas is advisable, the efficiency of the time parameter will average 36.5 %.

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УДК 338

BUSINESS PROCESSES AS A TOOL FOR AUTOMATION OF THE COMPANY'S WORK

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Abstract. This article reveals the concept of business process and its components, tells the history of business processes and their purpose. The example of the impact of using a business process in an enterprise is given, an analysis of the possibilities of using business processes in companies with different revenues is carried out and examples of modern means of automating business processes are given.

Keywords: business process, company, business, revenue, system, software, supporting business process, development business process, management business process, core business processes.

БИЗНЕС-ПРОЦЕССЫ КАК ИНСТРУМЕНТ АВТОМАТИЗАЦИИ РАБОТЫ КОМПАНИИ

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Аннотация. В данной статье раскрывается понятие бизнес-процесса и его составляющих, рассказывается история возникновения бизнес-процессов и их предназначения. Приводится пример влияния использования бизнес-процесса в предприятии, осуществляется анализ возможностей использования бизнес-процессов в компаниях с различным доходом и приводятся примеры современных средств автоматизации бизнес-процессов.

Ключевые слова: бизнес-процесс, компания, бизнес, доход, система, программное обеспечение, обеспечивающий бизнес-процесс, бизнес-процесс развития, бизнес-процесс управления, основные бизнес-процессы.

Any company sooner or later goes through phases of formation and training. During this period, it is necessary to ensure effective internal interaction, both between individual employees and between departments. This process exists regardless of the

level and size of the company, it is relevant to both small and medium and large businesses.

In the race for profit and a place in the market, each company strives to implement such business organization tools, which will surpass the tools of competitors, will be more convenient, fast, flexible and clear. At any enterprise there is a strictly debugged algorithm of conducting business, using which the company makes a profit. Algorithm of any company operation is called a business process.

Business process is a logical sequence of actions of a person (or several people) in a team. ISO 9000-2001 standard defines a process as "a set of interrelated or interacting activities that transform inputs into outputs". The most common definition is as follows:

A business process is a set of different activities that uses one or more types of resources "at the input" and as a result of these activities "at the output" creates a product of value to the consumer [1].

Business processes, in turn, are divided among themselves into several basic ones:

1. Supporting business processes;
2. Development business processes;
3. Business management processes;
4. Core business processes.

Basic business processes create company's revenues. They include processes focused on production of goods or rendering of services, which are the target objects of the company's creation and ensure revenue generation. It is the basic business processes that form the result and consumer qualities for which an external customer is willing to pay money. For example, for a woodworking plant, the main business process may be the production of chipboard [2].

These processes are closely related to each other, and only when they are combined can an enterprise generate income. The scheme of basic business processes links is shown in figure 1.

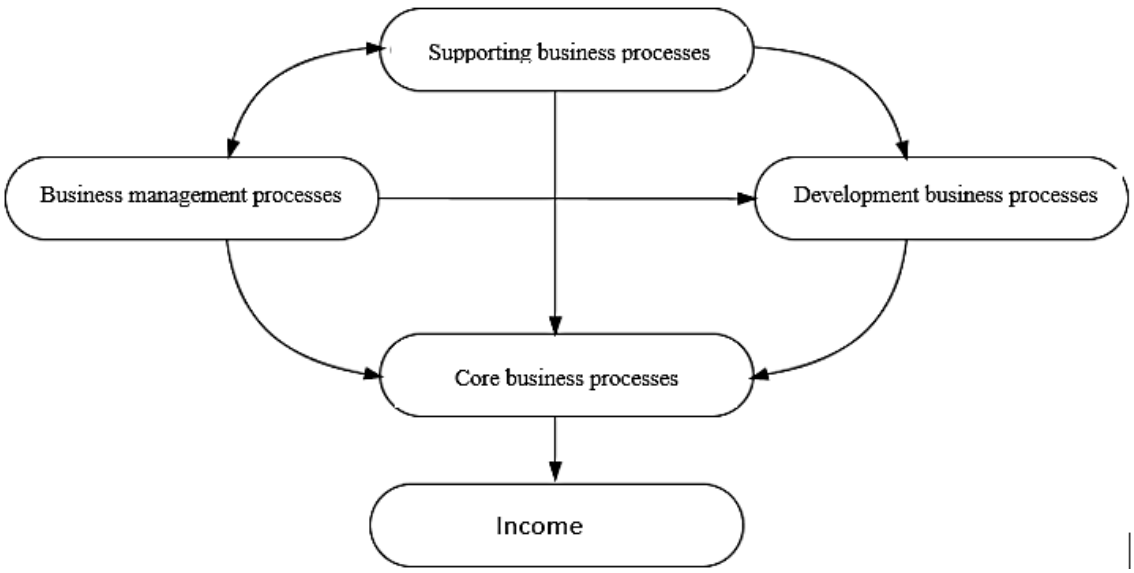


Figure 1. Diagram of basic business processes connection

Supporting processes support the infrastructure of the company, are designed to support all other processes and are focused on supporting their universal features. At enterprises of any industry, it is a process of financial support, personnel support, engineering support and so on [3].

Business management processes are processes that cover the whole range of management functions at the level of each business process and the enterprise as a whole: strategic, operational and current planning, formation and implementation of managerial impacts [4].

Business processes of development are processes of improvement of the produced goods or services, processes of development of technology, processes of modification of equipment, as well as innovative processes. For example, it is research and development (R&D) in mechanical engineering, the process of technical re-equipment in the electric power industry, and so on [5].

A distinctive feature of the main processes is that they are directly involved in the implementation of the business directions of the company. In most cases the list of core business processes is a mirror reflection of the company's business direction tree.

The concept of "business process" appeared in the early 1980s. At that time, the attention of many companies began to attract the process of total quality management TQM is a continuous process of purposeful impact on the objects of quality management, carried out at all stages and phases of the life cycle of a product (service), aimed at forming, providing and maintaining the specified (required) level of quality, satisfying the requirements of consumers and society as a whole, later this trend evolved into business process re-engineering, the main feature of which became a rejection of the concept of business processes. In place of re-engineering came enterprise resource planning ERP. ERP is a software package for managing a company. Such a system stores and connects data on all business processes: most often it is sales, accounting, production, warehouse, purchasing, human resource management and projects. later appeared the customer relationship management system CRM, aimed at CRM maintaining processes aimed at developing strong relationships with customers, such as updating contact information, collecting and checking customer information, and directing potential customers or buyers to the right employee [6].

At the moment, all of these business processes are used by companies in one way or another. However, due to the rapidly changing consumer demand, growth of the number of competitors and the positive dynamics of development in the field of technology, it is logical that the existing business processes need to be rethought and refined to a state where the functioning of the company will be automated. So how to achieve such a result? To realize automatic business management, it is necessary to understand the meaning of the word combination "automation of business processes".

Process automation is a special case of optimization. It helps businesses save on routine. Algorithms perform repetitive tasks faster, and employees have more time for other things.

The essence of automation is the introduction of software that allows you to combine several internal processes of the company and perform them independently [7]. To improve perception, I will give an example of management, taking a company

working with different stores as a base. The process of selling goods in such a company, when working "manually" is shown in figure 2.

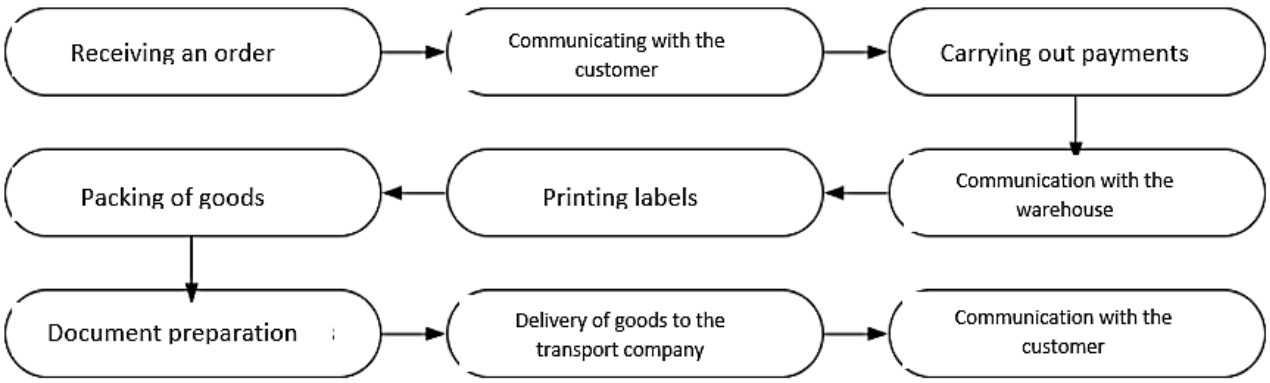


Figure 2. Sales process without automated business processes

If automated business processes were used, such a company could reduce the number of actions to get a result by several times. The process of selling goods in the company, when using automated business processes in the work is shown in figure 3.

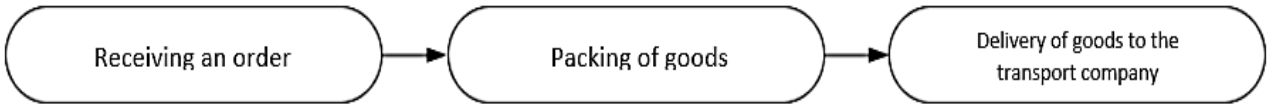


Figure 3. Sales process using automated business processes

The convenience and necessity of such systems are obvious, but can automation be applied to all processes? Modern software allows you to bring any work process to a simple automated algorithm, in particular this applies to the processing of transactions, mailings, documents, various types of accounting, payments. At the beginning of the formation of any company, the main focus should be on these aspects, in which case growth will not be accompanied by a long period and will be carried out much easier and faster. More complex work can also be subjected to automation, but it is more suitable for fairly large enterprises, as accompanied by large financial and human resource costs, in addition to this requires sophisticated software.

For different businesses need to select an individual approach to the adjustment of business processes, so for small businesses is not always possible to use expensive software, fortunately, it is not always required because of the still small turnovers, and many digital services offer a trial period using their product, which will test a particular system and determine the need for its implementation.

Large companies most often conduct debugging of the whole system, rather than individual processes within the company, which is accompanied by high costs, but it allows the company to become a single mechanism, speeding up work and increasing profits in the long term.

At the moment the following automated business process management systems are gaining in popularity:

1. HRM (Human Capital Management) is a resource management and planning system, a program that stores all the information about the business processes and orders of the company, it synchronizes the activities of different departments. The main purpose is to collect and structure information and automate processes [8].

2. ECM (Enterprise Content Management) is a set of defined technologies that include processes that allow to efficiently receive, organize, store and provide the necessary information to its employees, stakeholders and customers [9].

3. BPM (Business Process Model) is a business process management system that helps to implement the concept of process management in the real practice of companies [10].

4. WMS (Warehouse Management System) is an information system designed to automate the management of warehouse processes and warehouse infrastructure as a whole [11].

5. TMS (Transportation Management System) a logistics platform that uses technology to help companies plan, execute and optimize the physical movement of goods, both inbound and outbound, as well as ensuring that deliveries meet requirements and have the right documentation [12].

6. ERP (Enterprise Resource Planning) is an organizational strategy to integrate production and operations, labor management, financial management, and asset management, focused on the continuous balancing and optimization of enterprise resources through a specialized integrated application software package that provides a common data and process model for all areas of activity [13].

Each of these methods allows you to adjust the process of the enterprise, both at the level of the internal agenda, and at the level of the external their use allows you to increase productivity and reduce its costs. The main thing is to perform the work on automation correctly, otherwise at best they will not bring the desired effect, and at worst they will lead to financial losses.

In conclusion, it should be emphasized that not everyone needs the automation of business processes. It is useful for developing companies with good dynamics - it will help them grow even faster. If there is no noticeable growth, it is better to think first how to achieve it without automation.

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THE BRICS COUNTRIES' CONTRIBUTION TO THE BUILDING UP OF THE MULTIPOLAR WORLD

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Abstract. The article presents the work of the interstate association of five BRICS countries. The activities, goals and objectives of the association in various fields are highlighted. The list of trade operations between the states that have a positive impact on our country is given. The political impact of the BRICS on the exiting world order is evaluated.

Keywords: BRICS countries, special military operation, foreign trade, sanctions, external management, business operations, crisis situation.

УЧАСТИЕ СТРАН БРИКС В ПОСТРОЕНИИ МНОГОПОЛЯРНОГО МИРА

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Аннотация. В статье представлена работа межгосударственного объединения пяти стран BRICS. Выделены мероприятия, цели и задачи объединения в различных сферах. Приводится список торговых операций между государствами, которые имеют положительное влияние на нашу страну. Оценивается политическое влияние союза на существующий миропорядок.

Ключевые слова: страны БРИКС, специальная военная операция, внешняя торговля, санкции, внешнее управление, деловые операции, кризисная ситуация.

For the first time, the term "BRIC" was developed and used in 2001 by researchers at Goldman Sachs Corporation, led by Jim O'Neill [1, p. 58]. The prerequisites for the formation of the informal union arose quite a long time ago. Back in 1998, in the city of Delhi, E. M. Primakov (a Russian politician and diplomat; the Prime Minister of Russia from 1998 to 1999) proposed the idea of creating a strategic Eurasian triangle "Russia-India-China" [2, p. 43-44]. With the beginning of the new millennium Russian and foreign experts began to actively discuss the possibility of the formation of such a triangle and its viability. The union was formed in 2006 on the

initiative of Russia. The procedure took place at the St. Petersburg Economic Forum. Initially the name used the abbreviation BRIC as an association of four countries – Brazil, Russia, India and China. But when South Africa joined it in 2011 the letter C was added. In 2014, the BRICS states founded their own international financial institution, the New Development Bank, headquartered in Shanghai to mobilize the resources necessary for the implementation of projects in the field of infrastructure and sustainable economic development in the BRICS countries. From the very beginning the BRICS project was based on the principles of multipolarity, interdependence of the economies of the countries, the priority of the international law in strengthening peace and stability, as well as collectivity in solving global problems [3, p. 155-156]. In addition, among the goals of creating the group, it is important to emphasize the expansion of the linguistic, cultural and information blocks of interaction. As stated on the website of the Ministry of Economic Development of the Russian Federation, the BRICS members occupy a unique place in the global economy. Their combined share in world GDP is 30 % (according to the purchasing power parity of national currencies) in 2014. The BRICS countries are a large-scale global market. The total number of their inhabitants is about 2.8 billion people, or 42 % of the world's population. The main areas in which the BRICS members cooperate are trade, investment and finance, digital agenda and sustainable development. Among the events held by the BRICS are:

− annual summits;

− meetings of representatives in charge of national security issues;

− meetings of the managers of the New Development Bank;

− meetings of foreign ministers, ministers of economy and foreign trade, as well as heads of other departments;

− meetings of working groups cooperating in various fields.

On July 27, 2022 the official representative of the Russian Foreign Ministry, Maria Zakharova announced in her Telegram channel that Argentina and Iran had applied for joining the BRICS. The assistant President of the Russian Federation Yuri Ushakov said that Moscow has a positive view on the issue of expanding the BRICS [4]. Cooperation within the BRICS is mainly aimed at developing market access opportunities and deepening connections between markets, supporting mutual trade and the creation of a favorable environment for investors and entrepreneurs, deepening the exchange of macroeconomic information and increasing resilience to external financial and economic shocks, sharing information through the BRICS platforms. Currently, the cooperation in the format of the five BRICS states arouses some interest in the international arena due to the significant economic and resource potential of the participants, taking into account their population. At the same time, the growing BRICS influence on the international economic relations is beyond doubt. Having started their dialogue with economic issues, the BRICS countries have moved on to global ones. The final Declaration in Brazil (2019) in particular states the necessity to strengthen international institutions (such as the UN, IMF, WTO and other organizations): to promote financial and economic cooperation based on the open markets developing, fair and non-discriminatory business conditions, structural

reforms, effective and fair competition; to promote investments and innovation, financing infrastructure and development projects; to increase the developing countries' participation in global value chains. In addition, the Declaration covers the issue of regional conflicts: the BRICS countries call for collective efforts to peacefully resolve disputes by political and diplomatic means. The special attention is paid to the development of mutually beneficial cooperation between the BRICS countries based on the desire for mutual respect and understanding, equality, solidarity and openness. In 2020, the BRICS chairmanship passed to Russia. The chairmanship priorities were: strengthening the multilateral principles in global politics, promoting the BRICS countries' common interests on international platforms; developing cooperation in trade, financial and economic spheres, as well as in humanitarian and cultural spheres.

The world has divided into two camps in relation to Russia's actions in Ukraine. Among those who supported or accepted neutrality on the issue of a special military operation were Russia's allies in the BRICS group. On June 23, 2022, the meeting of the XIV BRICS Summit started. The President of Russia and the leaders of China, Brazil, India, and South Africa discussed the cooperation in political, economic and cultural fields via videoconference. The leaders of the "five" states opposed the sanctions and stressed that the BRICS countries should participate in the formation of a truly multipolar system in the world. The theme of this year's BRICS summit meeting was "Strengthening the high-quality BRICS partnership entering a new era of the global development." Vladimir Putin, in his welcoming speech, announced the growth of the BRICS authority on the world stage, which is especially important in the conditions of the crisis in the world economy. He stressed that the transnational nature of challenges and threats requires joint responses. "The states of the Five are known to have enormous political, economic, scientific, technological and human potential," the Russian leader said. Putin noted that only together it is possible to solve such problems as conflict resolution, the fight against terrorism and organized crime, opposition to climate change and the spread of dangerous infections. The leadership of the BRICS countries is in demand today for building a multipolar world. "We are convinced that now more than ever, the leadership of the BRICS countries in developing a unifying, positive course towards the formation of a truly multipolar system of interstate relations based on universally recognized norms of international law and the key principles of the UN Charter is in demand," Vladimir Putin noted [5]. Brazilian President Jair Bolsonaro said: "Brazil will not vote for a UN resolution convicting Russian President Vladimir Putin or proposing anti-Russian sanctions because of Russia's operation to protect Donbass" [6]. India and China officially took the side of neutral countries, but they believe that unilateral sanctions are not backed by the international law, so they did not support the resolution condemning the Russian special operation in Ukraine. The Republic of South Africa calls for a diplomatic resolution of the Ukrainian crisis with the involvement of the UN. Thus, it is obvious that Moscow's partners in the group do not sympathize with the policy pursued by the West. They are aiming to maintain the established agreements and commitments. Obviously, there are prerequisites for both comprehensive cooperation and rivalry between the BRICS countries and the

West, but the alliance strategy towards NATO, the United States and the G7 countries is more of a peacekeeping rather than aggressive nature. In addition, the "Five" does not assume the substitution of existing international relations, but declares itself as an additional format of well-thought-out coordinated positions which is able to contribute to the activities of other international associations and strengthen its voice in these associations.

After the beginning of Russia's special military operation in Ukraine, as well as the introduction of the largest ever sanctions against our country, the trade indicators began to grow dramatically. Only in the first quarter of this year, Russia's trade with the BRICS countries grew by 38 % – up to $45 billion. Compared to the same period of the last year, in January-March 2022 there was an increase in exports of steel semi-finished products (4.3 times), mixed fertilizers (three times), frozen fish, flax seeds, textiles and shoes (more and more than twice). However, the volume of deliveries to Russia from the partners has also grown. Thus, in the first three months we received 13 times more non-electric water heaters, and more than doubled imports of air conditioning units, new pneumatic rubber tires, as well as poultry meat, offal and soybeans. Indian chain stores can come to our country, as well as more Chinese cars, equipment and machinery. “The volume of Russian oil deliveries to China and India is growing noticeably. Cooperation in the field of agriculture is developing dynamically. Russia exports significant volumes of fertilizers to the BRICS countries. Russian IT companies are expanding their activities in India and South Africa, and our satellites provide television broadcasting to 40 million dwellers in Brazil,” said the President of the Russian Federation [7].

The head of the Russian Ministry of Economic Development, Maxim Reshetnikov, speaking at a meeting of the BRICS ministers of economy and foreign trade on June 9 said: "This year the joint initiatives of the BRICS have gained special significance. An important task of the BRICS is to form “safety” or even alternative mechanisms that would preserve the supply chains with the participation of our countries and ensure stable conditions for the international trade. First of all, for the smooth implementation of payments and the development of the resistant to external shocks logistics infrastructure, the non-discriminatory movement of technologies and goods, as well as the development of reinsurance mechanisms… After a number of foreign companies left the Russian market, business from the BRICS countries began to successfully replace them" [5]. Earlier, the head of the Russian Ministry of Industry and Trade, Denis Manturov, outlined the main vectors of cooperation in which the BRICS countries could achieve maximum results. Among them, in particular, are biological and energy security, food providing, the development of green energy and the digitalization of the economy. "We have a lot of opportunities to expand cooperation not only through mutual supplies, but also through joint researches and cooperation in creating independent value chains" said Minister Denis Manturov [8]. BRICS has a lot of opportunities for development in various areas. The trade volume between our countries has been steadily growing in recent years. If in 2013 it was about $105.4 billion, then last year it increased to $163.7 billion.

Vladimir Putin said: "Now the leadership of the five countries is working on creating an international reserve currency based on the basket of currencies of the BRICS countries" [5]. "Since we are talking about the international reserve currency, apparently, it can be based on SBR (special borrowing rights) – an international reserve asset created by the IMF," said Alexander Potavin, a leading analyst at FG Finam. "The process of making such a currency is very slow, since there are a lot of difficult problems to be resolved. For example, ensuring 100 % liquidity, opening a deposit in any serious bank in the world, free purchasing various exchange commodity futures on any of the largest commodity exchanges in the world. All these issues require enormous human and financial costs", said A. Potavin [5].

The association of five states is functioning successfully due to the fact that all its members complement one another favorably. Therefore, we can say that the BRICS group today is becoming an attractive and important alternative platform. In general, the new economic order is already changing the balance of power in the world. The indicators of Western economies (for example, the United States and the European Union) are falling, the BRICS countries are bearing the palm. Despite the fact that the BRICS is an informal association of five states, today it has a huge impact on the global economy. More than three billion people live in the countries of the "five", and together Russia and its partners are forming a quarter of the world's GDP, 20 % of trade and about a quarter of direct investments. On the eve of the BRICS summit, a business forum bringing together about a thousand representatives from 18 countries of the world was held. Among them there were businessmen presenting 40 companies from the Forbes magazine ranking of the 500 largest enterprises. The organization is planing to expand, so potential members are already actively invited to joint meetings. For example, Argentina and Saudi Arabia. In addition, the countries taken to the BRICS New Development Bank last year such as Bangladesh, Egypt, the United Arab Emirates and Uruguay are called likely candidates. Moreover, the representatives of Indonesia, Kazakhstan, Nigeria and Thailand were also present at the meeting of the five's foreign ministers in May.

The BRICS countries are supporting:

- the reform of the UN Security Council and the WTO;
- exclusive powers of the UN Security Council to impose sanctions;
- negotiations between the Russian Federation and Ukraine, leading to a peaceful resolution of the crisis;
- continued cooperation despite the COVID-19 pandemic and other challenges;
- universal access to cheap, reliable, sustainable and modern energy sources;
- responsible economic policy on the part of the developed countries;
- strengthening the arms control system and maintaining its integrity in the interests of global stability;
- a world free of nuclear weapons;
- strengthening the macroeconomic coordination for recovery from the pandemic;

- strengthening the cooperation in the fight against corruption and the return of assets;

- activation of tourist exchanges;

- continued cooperation in the field of customs control [5].

Thus, BRICS is a reality of world politics and economy obtaining the necessary resources for progressive development. The format of the group provides organization of periodic official summits, availability of reports on meetings and signing agreements. It goes without saying that, there is a lot of contradictions within the association the elimination of which is possible due to the mutual interest of the participating countries, the constant development and improvement of ways of interaction. As a result of collective action, the power of the BRICS on the world stage will grow. Moreover, Russia reserves the status of its active member, initiating modern trends and ideas and implementing a plenty of relevant projects for the effective functioning of the association. Today BRICS is actually presenting the core of the multipolar world, and its transformation into a strong and influential organization is expected in the long-term prospect.

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MARKET OVERVIEW OF PHOTOVOLTAIC AND WIND POWER PLANTS IN RUSSIA AND THE WORLD

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Abstract. Renewable energy sources (RES) make a significant contribution to the production of electric energy both in individual countries and in the global energy system, generating about 30 % of the electricity on the planet. The renewable energy sources market has changed significantly over the past decades, monopolistic companies have appeared, which occupy the main share in this energy sector. The leading countries in the manufacture of photovoltaic and wind power plants are China, Germany and the USA, however, there are also domestic manufacturers on the Russian market who are able to provide equipment for renewable energy sources not only for the domestic needs of the country, but are also ready to supply to foreign markets. This article analyzes the state of the global and Russian market of photovoltaic and renewable installations, and also identifies manufacturers that occupy leading positions in the field of renewable energy sources.

Keywords: alternative energy, renewable energy sources (RES), wind energy, solar energy, the Russian renewable energy market.

ОБЗОР РЫНКА ФОТОЭЛЕКТРИЧЕСКИХ И ВЕТРОЭНЕРГЕТИЧЕСКИХ УСТАНОВОК В РОССИИ И МИРЕ

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Аннотация. Возобновляемые источники энергии (ВИЭ) вносят существенный вклад в производство электрической энергии как в отдельных странах, так и в мировой энергетической системе, вырабатывая около 30 % электроэнергии на планете. Рынок возобновляемых источников энергии за последние десятилетия существенно изменился, появились компании-монополисты, которые занимают основную долю в данной отрасли энергетики. Странами-лидерами по изготовлению фотоэлектрических и ветроэнергетических установок являются Китай, Германия и США, однако и на российском рынке существуют отечественные производители, которые

способны обеспечить оборудованием для возобновляемых источников энергии не только для внутренних потребностей страны, но и готовы заниматься поставками на внешние рынки. В данной статье проанализировано состояние мирового и российского рынка фотоэлектрических и возобновляемых установок, а также выделены производители, занимающие лидирующие позиции в сфере возобновляемых источников энергии.

Ключевые слова: альтернативная энергетика, возобновляемые источники энергии (ВИЭ), ветроэнергетика, солнечная энергетика, российский рынок возобновляемой энергетики.

Alternative energy, including renewable energy, is an integral direction in such an industry as energy. The search for practically inexhaustible natural resources for the environmentally friendly production of thermal and electrical energy has led to the development of unconventional energy sources, the most widely used in the world of which at the moment have received solar and wind parks for electricity generation [1].

Even 30 years ago, the renewable energy market mainly consisted of small companies that offered relatively expensive equipment with low productivity. Now renewable energy is actively monopolized. Leading companies offer a wide range of technologies and thanks to large-scale production of different price ranges.

The largest manufacturer of wind turbines is Vestas, whose headquarters are located in Denmark [2]. Vestas is actively engaged in commercial activities in Russia, and also performs installation work of wind farms in the country.

One of the world leaders in the offshore wind energy market is the Spanish-German company Siemens Gamesa with a market share of about 70 % in Europe, headquartered in Germany [3].

Wind turbines are also produced by Goldwind (China), General Electric (USA), Shanghai Electric Group Company Limited (China), Enercon (Germany), Senvion SE (Germany), Envision Energy (China).

In September 2017, NovaVind JSC, a branch of Rosatom, was founded on the territory of the Russian Federation. NovaVind is responsible for the development of wind power in Russia, the company owns such wind parks as the Adygea wind Farm, Kochubeyevskaya wind Farm, Karmalinovskaya wind Farm, Marchenkovskaya wind Farm, Bondarevskaya wind Farm, Medvezhenskaya wind Farm, Berestovskaya wind Farm.

NovaVind JSC is engaged in the design of wind power plants, has its own production of wind power plant components (wind turbines), manages the supply chain and logistics of components to the site, and also performs installation of installations and subsequent necessary service. The partners of JSC "NovaVind" are 69 companies, of which 42 are Russian, 27 are foreign.

The NovaVind plant is located in Volgodonsk, Rostov region and produces an average of 100-120 turbines per year. By 2021, the wind parks of NovaVind JSC are fully equipped with equipment that is manufactured in the territory of the Russian Federation. A 2.5 MW wind turbine is in serial production, and the transition to a 4.5 MW wind turbine is also underway [4].

In addition to the wind power plant, power converters of current and frequency, transformers, power lines and communications, meteorological stations are installed at the wind power plant, and it is also possible to use electric power accumulators. All the necessary equipment for the construction of wind farms is made in Russia. For example, on the territory of the Russian Federation, Atomenergopromsbyt JSC is engaged in the supply of electricity storage systems (SNES), which offers container assembly of SNES based on lithium-ion batteries with a capacity of up to 2 MW.

In 2017, the American company Tesla built an energy storage system with a capacity of 100 MW / 129 MWh, and with further expansion, the capacity was 150 MW / 193.5 MWh.

In 2021, a 300 MW/450 MWH SNE was commissioned in Australia. The storage uses 212 Tesla Megapack units, each with a capacity of 3 MW·h.

The volume of investments in the construction of a wind farm using the L100 2.5 MW wind turbine produced by NovaVind is approximately 130-150 million rubles per 1 MW of installed wind farm capacity or 330-390 million rubles per L100 2.5 MW wind turbine. These data are obtained from the existing projects of NovaVind JSC, the cost includes the costs of construction of access roads and clearing of the territory, construction of the main structures for the operation of a wind power plant, manufacture of wind generators and necessary equipment, foundation filling, delivery and assembly of a wind power plant, installation of power lines and fiber-optic communication, testing and commissioning.

It is obvious that the energy industry, and in particular wind, is developing and new technologies are emerging that allow reducing the cost of wind power plants. For example, the Norwegian company Wind Catching Systems has developed an offshore wind generator consisting of a variety of low-power wind generators that are placed in a metal structure [5]. This technology allows you to generate electricity at a low wind speed, is cheaper to maintain and occupies smaller territories.

The world leader in the production of photovoltaic modules and additional equipment for SES is the Chinese company Longi Green Energy Technology, headquartered in Xi'an [6]. The organization is engaged in design, manufacture, installation, commissioning, maintenance, and also carries out financial expertise of projects.

The second place is occupied by Jinko Solar, headquartered in Shanghai, China. It is one of the most famous and innovative companies in the field of solar technologies in the world. Currently, Jinko Solar products serve more than 3,000 customers in more than 160 countries around the world [7]. For many years, the company has been ranked first in the world in the supply of photovoltaic modules.

The largest manufacturers of solar panels and equipment for their operation are also companies: JA Solar Holdings (China), Canadian Solar (Canada), Risen Energy (China), Hanwha Q-Cells (South Korea), Trina Solar (China), First Solar (USA).

There are about 50 companies in the Russian solar energy market that are engaged in the supply and installation of equipment for SES. For example, the company "Your Solar House", located in Moscow, has been operating in the market of autonomous and backup power supply systems for 19 years, actively using energy sources such as solar panels, wind turbines and biofuels. The company is engaged in

the delivery and installation of all necessary elements of the SES, the cost of solar photovoltaic modules with a capacity of 340 watts is 21 thousand rubles, a kit for installation with trackers is 20-50 thousand rubles. rubles, a charge controller of 8-180 thousand rubles, an inverter of 25-450 thousand rubles, and there are also ready-made projects of network solar power plants with a capacity of 60 kW worth 4.2 million rubles [8].

Since 1963, the Ryazan Plant of Metal-ceramic Devices (RZMKP) has been producing products for industrial, technical and special purposes. Currently, the plant manufactures solar modules with a capacity of 100-240 watts with an efficiency of 12-17 %.

JSC NPP Kvant is engaged in the creation of highly efficient solar modules for space and ground-based photoenergy. At the moment, the company manufactures modules with a rated power of 180-210 watts and an efficiency of about 20 % [9].

LLC "Thermotron-Plant" has been producing a wide range of high-tech, innovative products designed for traffic safety on railways and metro lines in Russia for more than 30 years, and also manufactures autonomous solar stations with a capacity of 3-50 kW [10].

One of the largest manufacturers of equipment for solar power plants is the Hevel Group of companies. The organization has been working for more than 10 years in the solar energy industry, has the only full-cycle plant in Russia for the production of heterostructured solar cells and modules on an industrial scale. The plant was built in 2009 in Novocheboksarsk (Chuvash Republic), and upgraded in 2016.

Hevel is engaged in the design, construction and operation of SES, the production of equipment for solar power plants, and also conducts active research activities in the field of solar energy. According to the Hevel Group of Companies, the company's project portfolio in Russia is 1.1 GW, the total capacity of the built SES is 711.5 MW, the annual production volume is 340 MW [11].

There is a scientific and technical center in St. Petersburg, which is aimed at developing integrated solutions based on FEP, increasing efficiency and reducing the cost of production of photovoltaic modules, developing new technologies for the production of solar converters, testing materials and developing new raw materials. The company was able to achieve a record efficiency indicator, which was 24.1 % for solar cells, and 22.3 % for solar modules.

Hevel is engaged in the production of photovoltaic facades that generate electrical energy and provide aesthetic appeal of the object. Photovoltaic facade systems are applicable on all types of commercial and residential buildings, both on newly constructed and reconstructed buildings and structures. Any images and textures can be applied to photovoltaic modules, as well as solar panels can be made in color.

Based on the existing projects of Hevel and according to the companies represented on the Russian market, capital expenditures, taking into account the cost of basic equipment, supporting structures and installation work for 1 MW of installed capacity of a solar power plant, amount to 100-130 million rubles.

An analysis of the Russian market of manufacturers of photovoltaic and wind power plants has shown that there are organizations on the territory of the Russian Federation that carry out a full cycle of production of equipment for renewable energy

sources, besides having a significantly lower cost than imported analogues. This study completely destroys the existing myth in society that "nothing is produced in Russia." Despite the fact that the world leaders in the production of wind turbines and power plants are foreign companies, namely European and Chinese, domestic manufacturers are able to cover the need for technical equipment and materials for the construction of wind and solar power plants on the territory of the Russian Federation [12; 13].

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ART AND DESIGN OF MODERN COSTUME

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Abstract. Art at each stage of the evolution of society appears as a set of areas of creative activity, focused on the creation of a universal aesthetic system of coordinates, which is consonant with the system of values that is relevant for this era. The influence of art on all spheres of social life is undeniable, it sets the leitmotif of a person's spiritual life, which subsequently affects the nature of the cultural environment produced by society and the vector of social progress. Design is a multifunctional tool of material culture, and just like art, it carries a powerful creative potential. Being involved in almost all spheres of human existence, design forms a person's ideas about the modern level of comfort, affects consumer preferences. In this sense, design, according to the author, is located at a lower level of the pyramid of programming social aesthetic attitudes compared to art, which means that it experiences the full influence of "pure" art. The field of costume design is no exception, especially when it comes to the development of author's ready-to-wear collections that set the tone in the fashion world. However, the relationship between art in the broad sense of the word and costume design is multifaceted and partly reciprocal, due to the gradual crystallization around the global fashion infrastr

Keywords: costume design, contemporary art, clothing design, costume design pret-a-porter.

ИСКУССТВО И ДИЗАЙН СОВРЕМЕННОГО КОСТЮМА

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Аннотация. Искусство на каждом этапе эволюции общества предстает как совокупность направлений творческой деятельности, ориентированная на создание универсальной эстетической системы координат, которая созвучна актуальной для данной эпохи системе ценностей. Влияние искусства на все сферы социального бытия неоспоримо, оно задает лейтмотив духовной жизни человека, что впоследствии отражается на характере произведенной обществом культурной среды и векторе социального прогресса. Дизайн представляет собой многофункциональный инструмент материальной культуры, и он так же, как и

искусство, несет в себе мощный креативный потенциал. Будучи задействован практически во всех сферах бытия человека, дизайн формирует представления человека о современном ему уровне комфорта, влияет на потребительские предпочтения. В этом смысле дизайн, по мнению автора, располагается на более низкой по сравнению с искусством ступени пирамиды программирования социальных эстетических установок, а значит испытывает на себе всю полноту влияния «чистого» искусства. Не является исключением и сфера дизайна костюма, особенно, когда речь идет о разработке авторских коллекций прет-а-порте, задающих тон в мире моды. Однако взаимоотношения искусства в широком смысле слова и дизайна костюма многогранны и отчасти носят обоюдный характер, что связано с постепенной кристаллизацией вокруг мировой инфраструктуры моды.

Ключевые слова: дизайн костюма, современное искусство, проектирование одежды, дизайн костюма прет-а-порте.

At the current stage of development of mass culture, the understanding of "pure" art, contemporary art as such in the scientific community is not complete. In scientific journalism and research works, one can find many interpretations of the concept of "contemporary art", based on the understanding of this phenomenon, taking into account the chosen chronological framework or analyzing the qualitative characteristics of the style of certain authors, recognized by art critics as legislators of traditions in art; and, if we take into account the national identity, which is subject to the evolution of contemporary art within different cultures, then bringing the views of individual researchers to a common denominator generally becomes a hopeless task. Such disagreement in opinions has given rise to many different terms, each of which, along with the basic characteristics of the concept of "contemporary art", also contains nuances of vision from the point of view of the angle chosen by the scientist. It is a very difficult task to try to define the terms "actual art" or "contemporary art", "modern art" or "contemporary art", which are closely related in their essence. Moreover, in a number of works, these concepts are defined through one another: contemporary art is often described as an actual form of art, which is an original and non-standard artistic embodiment of the surrounding world that exists at the time of the creation of a work of art.

The metamorphoses taking place in the field of art often become an occasion for formulating the concepts of the development of contemporary art among philosophers and culturologists. M. McLuhan, T. Smith, J. Baudrillard, as well as P. Weibel, E. N. Shapinskaya, M. Castells and many others addressed this issue in their works. The conclusion that the researchers come to is the gradual distancing of contemporary art from real life, its radicalization and elitism.

Design, being a form of creative activity, traditionally uses the whole range of cultural and philosophical possibilities of art – aesthetics, formal content integrity, artistic expressiveness and imagery. Design acts as the most important regulator of the socio-economic and at the same time cultural and psychological climate in society. By

purchasing consumer goods, including wardrobe items, an individual satisfies his material needs and at the same time indexes his social status, corresponding to the semantics of the purchased product. The product becomes a symbol of belonging to a certain group (differentiated by the level of wealth or education, professional or cultural interests, etc.). Consequently, product design turns into an objective activity to create specific symbols of social meaning “by giving the external forms of products symbols of prestige, prosperity, loyalty. Considered culturally, design is an art” [1]. So, points of contact between art and design as spheres of manifestation of creativity have been identified. Interestingly, some authors go even further, equating design and art, calling design a new stage, a modern incarnation of art, putting forward as the main argument the commonality of its goals and methods with the direction of individual branches of art, in which pragmatism also coexists with creative search. and delineated stylistic canons. A good example is the design of a national (folk) costume, which has an aesthetic and everyday purpose, due to which the folk costume “is also considered as an object of applied art” [2]. The difference in design in this case is that the designer does not aim to create an authentic product, to ensure that his work complies with the given patterns, but, on the contrary, is focused on creating a new form. A well-known limitation of his creative freedom is only the ultimate orientation towards the consumer of the products he creates, while in art the subjective "I" of the creator is recognized as the highest priority, both in relation to the ideological content of the author's work, and in the sense of its formal embodiment.

Delving into the nature of the costume as the most important element of culture, it is worth recalling that the word costume is translated from Italian as “custom, traditions, mores”. A detailed definition of the concept of "suit" includes such components as:

- consistency of garments (which is reflected in their purpose and stylistic unity);
- obligatory demonstration by means of a costume of a certain social and national specificity;
- verification by means of a costume of the gender and age qualities of its wearer, possibly, his professional and religious affiliation.
- utilitarian-protective functionality as the main purpose of clothing.

Summarizing these features, we can say that clothing serves the purposes of social semiotics, performing an extremely important communicative function: a suit transmits to the environment significant and diverse information about its wearer, his worldview, determining, among other things, the nature of his potential social connections.

The communicative essence of the costume as an object-sign, object-symbol is currently considered as a semantic core around which the artistic concept of the costume is formed. Since ancient times, the costume had a deeply sacred meaning, the semantics of its image, as well as "forms, type, principles of cut, proportions and manner of wearing, the nature of the decor and color scheme gave each ethnic group an individual identity and uniqueness" [3]. By the beginning of the 21st century, the "philosophy of the costume" has not changed at its core - as it did millennia ago: the

cornerstones in the design of the costume are its compliance with the aesthetic criteria of its time and the ability to communicate utilitarian information about its owner.

The tectonic changes that have taken place in the life of society in the post-industrial era as a result of globalization and universal digitalization have brought to life a new format of contemporary art, formulated a new set of aesthetic postulates, among which technological effectiveness, innovation and originality have taken the leading positions. The erasing of ideological and geographical boundaries between design schools in different countries, the intensification of cooperation and the exchange of experience in the biennale format gave rise to a new design ideology, once again confirming the well-known postulate of Academician Likhachev that “real cultural values develop only in contact with other cultures, grow on rich cultural soil and take into account the experience of neighbors” [4].

Costume design responded to the emergence of new trends by fundamentally restructuring clothing production technology, developing new approaches to its design and revising modeling techniques. Clothing design has reached a new level, in which the artistry of the image received a special sound. The form began to be determined not only and not so much by the purpose of the costume as by the design concept embedded in it.

Conceptual design, having penetrated into the sphere of mass consumption, turned clothes into an art object. Anne Hollander's slogan "Clothes are more than just clothes!" acquired tangible features. By the way, this kind of conceptual design is also characteristic of the Japanese designer I. Miyake, who proves the need for maximum personification of the costume, giving it properties that can emphasize the charisma of its wearer in texture. As you know, the conceptual vision of ready-to-wear clothing design was strongly influenced by postmodernism and abstractionism [5], reaching its maximum flourishing in the works of X. Vibskov, R. Kawakubo, X. Chalayan.

Domestic clothing designers are no less concerned about finding a style that effectively combines the trends of the Russian cultural code with the current fashion vector. Such a desire to combine conservative and revolutionary, perhaps, can be recognized as one of the trends in modern costume design. Its root cause is the need to build a new imagery in design on a solid foundation, which can be considered the aesthetic potential contained in cultural and national identity [6]. Solving this problem, modern costume design develops new approaches to decor, constructive solutions, and shaping. Many of the current innovations, as practice shows, are “prompted” by trends that have taken shape in contemporary fine arts, sculpture and architecture. The consequences of these borrowings can be seen in a number of costume design methods that are actively used today in the modeling of ready-to-wear collections.

Thus, a vivid manifesto of modernism and postmodernism with echoes of the late avant-garde carries a combinatorial method based on a special vision of the biomechanics of the silhouette (the so-called kinetic design), a modular cutting technique, transformation and deconstruction techniques, a one-piece cut technology, as well as the creation of a suit in oversized style. In general, experiments with all sorts of compositional "violations" of the classical design process – groupings and

insertions, permutations and coups, asymmetry and non-periodicity of the costume structure (expressed in the play of texture and material, color chaos), clearly testifies to the thorny path of fashion designers, laid in line with precisely modernist traditions.

Summing up the above reflections, it should be recognized that the abundance of techniques that allow you to create different costume concepts in recent years has led to the transformation of ready-to-wear costume design into a laboratory of creative projects. A stream of author's collections, made using any one style, as well as a real style cocktail, turned the design of a ready-to-wear suit into the ranks of pop art or art fashion. At present, a model for a sustainable transfer of ideas of "high" conceptual design, art fashion to the sphere of final consumption has not yet been developed. The only bridge connecting these two worlds remains the ready-to-wear design space, however, its system of principles is increasingly resembling the program of a new art form.

Art historians try to talk about the works of famous fashion designers, in the performances of new collections, critics begin to look for hidden cultural and philosophical implications. The suit in its design is becoming more and more complicated, the innovativeness of design solutions begins to dictate its aesthetics. And this clearly shows the influence of the trends of modern art. In the approaches to the design of modern costume, the ideological heritage of the artistic movements popular in recent decades, primarily modernism and postmodernism, is clearly traced.

Along with this, in the direction of ready-to-wear, the aesthetics of the designer's self-expression is of particular importance. The designer acquires the features of an artist and even a thinker, because, according to the figurative observation of the famous Italian architect E. Sotsass, "he designs the person himself, his appearance, emotions, lifestyle." All this testifies to the manifestation in the design of the costume of signs of an independent branch of art.

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SELECTION OF EQUIPMENT FOR THE LIGHTING CONTROL SYSTEM IN THE COUNTRY SITE

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Abstract. This paper contains information on the selection of a relay, a motion sensor, a controller and a microcontroller relay for the implementation of automated lighting on a country site. The equipment is selected for economical and safe lighting on the site.

Keywords: automated lighting system, country site, relay, photo relay, microcontroller relay, motion sensor, energy saving, security system, comfortable lighting.

ВЫБОР ОБОРУДОВАНИЯ ДЛЯ СИСТЕМЫ УПРАВЛЕНИЯ ОСВЕЩЕНИЕМ НА ЗАГОРОДНОМ УЧАСТКЕ

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Аннотация. В данной работе содержится информация о выборе реле, датчике движения, контроллера и микроконтроллерного реле для реализации автоматизированного освещения на загородном участке. Оборудование выбрано для экономного и безопасного освещения на участке.

Ключевые слова: автоматизированная система освещения, загородный участок, реле, фотореле, микроконтроллерное реле, датчик движения, экономия электроэнергии, система безопасности, комфортное освещение.

The world is progressing and becoming more and more technological. In this world, people are actively buying plots in the countryside and building private homes, then using this place for leisure or permanent residence: creating comfortable living conditions. Advances in automation are helping to create these conditions.

For example, very often people install a "smart home" system in their country houses, which can contain the following parameters:

- lighting control;
- temperature control;

- curtains control;
- lawn irrigation control;
- audio alarm control [1].

This paper presents one aspect of a smart home – the selection of equipment for the implementation of automated lighting of a countryside property.

An automated lighting system is renowned for the following benefits:

1. saving energy in the long run as the lighting operates under the necessary conditions.
2. security against unauthorized intruders on the plot.
3. an excellent decorative solution, not only to beautify the site, but also to make it comfortable at night or in unfavourable weather conditions.

However, this system has some disadvantages:

1. The components that make up the lighting system often deteriorate, leading to frequent troubleshooting and diagnosis of the system.
2. The high cost of system components and frequent maintenance entail high costs [2].

An automated lighting system needs to be carefully designed to meet expectations. It is important to understand which areas of the site should have separate lighting. It is important to avoid unnecessary strain on the electrical grid, as this may not only lead to a breakdown of the technical equipment with high financial costs, but may also be contrary to fire safety. For the design of a lighting system, 3D visualisation is often used and is carried out by qualified professionals [3].

The most important step in the design of an automated lighting system is the choice of controller. The most common controller of domestic production – the controller "Aven PLK200" (Figure 1). It has the following parameters:

- supply voltage from 10 to 48 V;
- Power consumption is not more than 13 watts;
- central processor;
- RISC processor Texas Instruments Sitara AM3358, 800 MHz;
- Flash memory capacity – 512 Mbytes (NAND) – available for storing files and archives, RAM capacity – 256 Mbytes (DDR3) [4].



Figure 1. «Aven PLC200» controller [4]

For automatic operation in darkness, a twilight relay (photo relay) is used as a light sensor. When a certain level of light falls, the relay receives a signal and transmits it to the luminaires. The FR-2M photo relay has been selected for this system (Figure 2) [5].

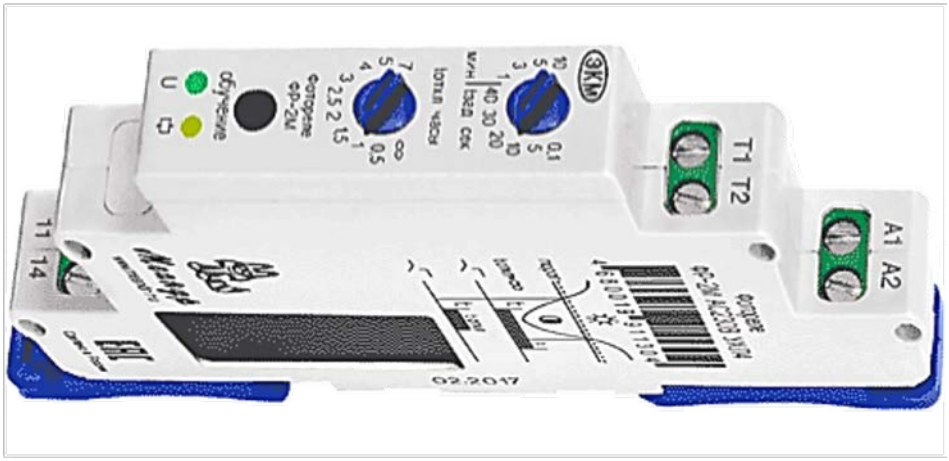


Figure 2. Photo relay «FR-2M» [5]

For maximum convenience, a time relay is added to this system. When the landlord drives home and turns on the lights, the lights will turn off automatically. In this case, an electronic relay will be used, which has a very high accuracy. However, the choice of this relay is one of the most expensive. The «Vekha DD» relay is the market leader in timed relays [6].

The budget-friendly motion sensor "REV 15283 5" is perfect for developing automated lighting as it has excellent technical features (Figure 3):

- time delay from 10 s to 7 min;
- range of action – 12 m;
- maximum viewing angle – 110 degrees;
- illuminance – from 3 to 2000 lux;
- operability at temperatures from – 20 to 40 degrees Celsius;
- sensor protection degree – IP44.

The motion sensor is installed at a height of 2-2.5 metres [7].



Figure 3. Motion sensor «REV 15283 5» [7]

The next step is to choose the lighting fixtures (Figure 4). The number of fixtures depends on the size of the site and the area. Nowadays there is a wide range of light sources to choose from [8]:

- Facade lights. Used in groups, they not only illuminate the walls of the house and structures, but can also separately highlight a door, porch or balcony.
- Wall and wall and ceiling lights. Includes facade and other models, hangs on walls and ceilings.
- Landscaping. Used mainly for decorative solutions that are limited only by the designer's imagination.
- Suspended. This type of light sources is usually hanged on special poles.
- Ground-based. Most often used to illuminate paths and footpaths on a site, installed in the ground.
- Spotlight. Combine security and lighting.
- Recessed. Models of this type can be used in many ways, built into curbs, stairs, tiles – it all depends on your imagination.

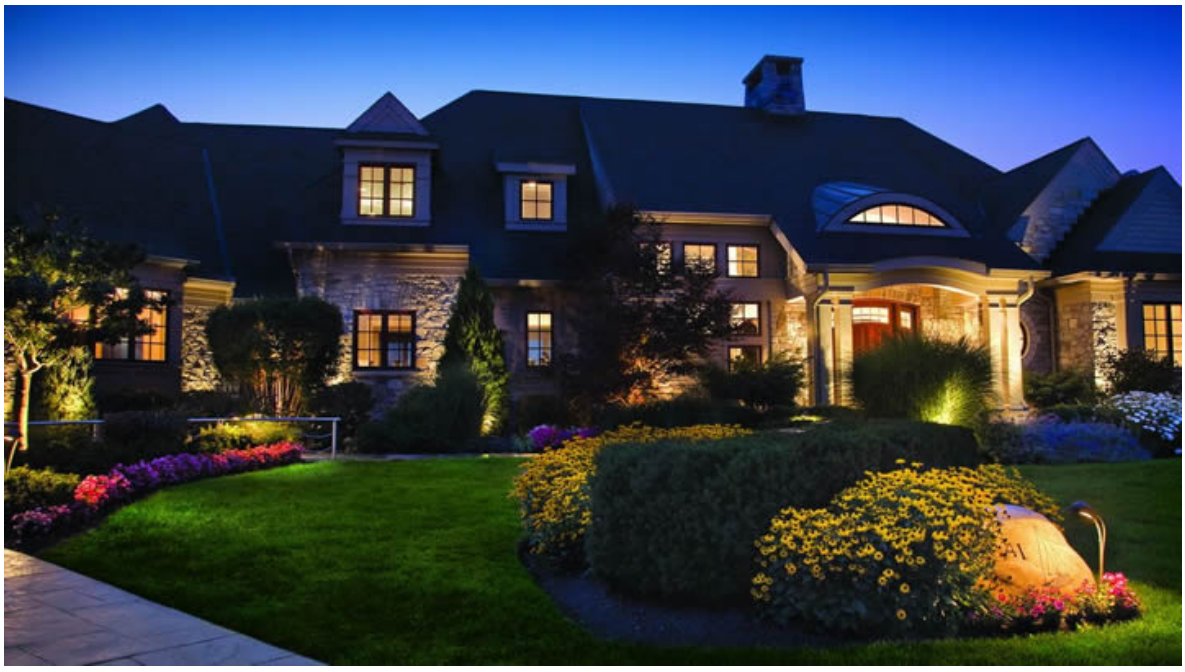


Figure 4. A country house with an automated lighting system

For this automated lighting system, we have chosen facade and landscape lights. Once the selected relays and lights have been installed, the equipment is connected to the controller. The controller is usually installed in the house or in a separate structure on the property. The lighting can be controlled remotely through the controller [9].

The equipment described above, which is part of an automated outdoor lighting system for the country site, is able to provide maximum illumination of the area, safety and energy savings.

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USE OF KAZAKH INTELLECTUAL GAMES FOR THE DEVELOPMENT OF A TEENAGER'S LOGIC

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Abstract. This article presents many points of view that you need to consider in order to use games as a learning tool. The elements of game design are considered that facilitate learning by promoting cognitive, behavioral, affective and socio-cultural interaction of students.

Keywords: games, training, development, teenager's logic.

ИСПОЛЬЗОВАНИЕ КАЗАХСКИХ ИНТЕЛЛЕКТУАЛЬНЫХ ИГР ДЛЯ РАЗВИТИЯ ЛОГИКИ ПОДРОСТКА

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Аннотация. В данной статье представлено множество точек зрения, которые необходимо учитывать, чтобы использовать игры как средство обучения. Рассматриваются элементы игрового дизайна, которые облегчают обучение, способствуя когнитивному, поведенческому, аффективному и социокультурному взаимодействию учащихся.

Ключевые слова: игры, обучение, развитие, логика подростка.

What are the psychological foundations of learning the game? In this article, we consider games as a complex genre of learning environments that cannot be understood by considering only one approach to learning. In fact, our review shows that many important concepts in the context of play, such as motivation, have aspects related to different theoretical foundations: cognitive, affective, motivational and sociocultural. We believe that in order for games to realize learning potential, all of these perspectives must be taken into account with a clear emphasis on the intention and design of the learning game [1, p. 170]. The use of play in an educational context and for learning and development purposes is not a new phenomenon. However, the growing acceptance of digital games as the main entertainment has raised the question of how to use digital games for educational purposes. Given the level of engagement that games create for a wide range of people and given the types of personal and social

services they provide, advocates consider games to be an ideal means of reading (Pren A meta-analysis of the effects of games on learning led to conflicting conclusions depending on what criteria were used to add and exclude items and what outcome variables were taken into account. These decisions were influenced by the authors ' theoretical approach to the use of digital games for learning. Among these approaches two stand out: a cognitive perspective and a sociocultural perspective. Depending on the perspective from which games are to be considered, they are seen as a stimulating environment, but may require the student to process excess information (cognitive perspective) or, conversely, they are seen as approaches that provide the rich contextual information and interaction necessary for learning in the 21st century (sociocultural perspective). Discussing games and learning and assessing its impact is complicated by the fact that games are so widely used as a generic term that they are not of great benefit in discussion without further refinement. And content genres (second language learning, science, history, etc.), but also game genres (casual, first-person shooter, multipla online). Of course, each of the previous genres overlaps and connects with the others [2, p. 318].

One consequence of the concept of gaming spanning all these genres is that it cannot be assumed that the research results obtained from studying games of one genre can be easily applied to another genre. For example, icons included in an MMO can be useful in guiding a student to perform certain learning-related activities, but can distract from reading when embedded in a casual game. In this article, we will attempt to present a comprehensive theoretical approach to play and learning, covering different learning approaches and fundamentals of game design. To this end, we will first discuss definitions of game-based learning and theoretical models that can describe learning through games. We will then describe the game design elements that will facilitate learning. Finally, we summarize how the design of these game elements is based on cognitive, motivational, affective and sociocultural foundations. The definitions of game learning mainly show that it is a type of game with certain learning outcomes. It is usually assumed that the game is a digital game, but this is not always the case. A consequence of this definition is that the process of developing learning games involves a balance between the need to address a topic and the desire to prioritize the game. This result shows the difference between game learning and gamification. What exactly gamification means varies, but one of its hallmarks is the use of game elements such as motivation systems to motivate players to perform a task they would not otherwise find attractive. Similarly, there is ongoing debate among scholars about the exact definition of the game, particularly not the game. One definition defines the game as "a system in which players enter into an artificial conflict defined by rules that lead to a numerical outcome". For example, consider gamification of math homework, which can involve adding scores and stars for completing existing homework that students find boring. On the other hand, learning the same mathematical topic in a game, although it may include dots and asterisks, requires a review of tasks, the use of artificial conflicts, and the rules of the game to make them more fun and engaging. Although it is not possible to resolve the debate about how games are defined here, this

may not be a problem since gaming-the most important activity in games-has long been considered an essential element of human development [3, p. 144].

However, a review of existing games quickly confirms that the uniqueness of learning the game is unlikely to be determined at the epistemological level. Game developers use behavioral elements, cognitive elements and constructivist elements and often their various combinations when developing educational games. For example, in the game Angry Birds, the student is invited to throw birds at the pigs hidden under various structures. In essence, the game takes a behavioral approach, providing a low-level challenge to maximize the damage of the pigs. However, the player's response to this test involves selecting a particular type of bird from a set of birds with different (destructive) abilities and provides flexibility in the vector (angle and strength) that the birds throw. The game shows the flight path of a bird and gives feedback on the damage caused visually, in the form of structural destruction and pig bruises, in the form of sound effects and in the form of points collected for each object or pig removed. The task itself (aiming at an object at a target location) is tedious and tedious, but the elements of the game used to complete the task such as game mechanics and the feedback provided make this game very fun, played by millions of people [4, p. 175].

Therefore, instead of a general theory of learning, we can consider a simple model that describes the basic structure that is present in almost every game. This structure consists of three main elements: call, answer and feedback. The loop occurs when the feedback is a new challenge or when the player is asked to answer another response to the initial challenge. The learning theory behind the development of a particular game manifests itself in the form of challenges that the game offers, in the form of facilitating answers and feedback that it provides. For example, the behaviorist game challenges the limited versions that the Player can respond to, and the feedback received is corrected in the same way as the right / wrong message. In contrast, a game based on a constructivist approach allows players to set challenges, offer accessible tools to create responses, and provide a peer feedback system. Returning to the observation that learning through and through games is definitely a unique experience, a complete model of game-based learning seems impossible, how else can one describe this experience? We propose that a promising method for determining the uniqueness of game learning can be found by focusing on how these learning environments were designed. While games were popularized for educational purposes, game design evolved into a complex art form with processes that differed in many ways from traditional learning environment design. One of these differences is that the developers of game exercises especially care about the quality of the learning process, which is tested with great effort and care [5, p. 11].

Our discussion in this section shows that the definition of game learning, especially the difference between game and non-game environments, is very difficult to achieve at an abstract and generalized level, although it seems intuitively possible. Trying to formulate a general theory of learning based on games is equally problematic, since games can be developed from any learning model. Instead, we proposed a

simplified model of game-based learning and showed that one of the defining characteristics of games is the particular concern of game developers about the quality of the learning process, and partly because of this concern, digital games can emotionally engage students. A behavioral, cognitive and sociocultural level that will succeed in many other learning environments. Next, we will describe the design elements used in educational games to evoke this presence.

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PROSPECTS OF USING SOLAR PANELS OF THE NEW GENERATION

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Abstract. This paper deals with innovative methods of solar energy generation through solar panel-windows. As a result of the analysis two ways of receiving solar energy with the use of solar panels and solar panels-windows are considered.

Keywords: solar panel, solar panel-window, alternative energy source, silicon, infrared light, ecology, electric power, sunlight.

ПЕРСПЕКТИВЫ ИСПОЛЬЗОВАНИЯ СОЛНЕЧНЫХ ПАНЕЛЕЙ НОВОГО ПОКОЛЕНИЯ

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Аннотация. В работе рассматриваются инновационные методы получения солнечной энергии через солнечные панели-окна. В результате анализа представлены два способа получения солнечной энергии: с применением солнечных батарей и солнечных батарей-окон.

Ключевые слова: солнечная батарея, солнечная батарея-окно, альтернативный источник энергии, кремний, инфракрасный свет, экология, электроэнергия, солнечный свет.

Methods of obtaining energy have been of concern to the world’s population for decades, but the main attention to the energy scarcity was paid in 1970, when the excessive price rises for conventional energy sources such as oil and gas led to an energy crisis that left a huge mark on the global economy. Fortunately, many of the problems of that time are in the past, but there has been an understanding that dependence on conventional energy sources has to be overcome. From that moment, the development of alternative energy sources began, which could provide not only some or all of the energy needs of the population, but could also be more

environmentally friendly. This is how wind power plants first appeared, and later solar panels.

Solar panels are currently one of the main sources of alternative energy. Recently, the technology for generating electricity from sunlight is gaining popularity in countries with highly developed and medium-developed economies, such as Europe, USA, Germany, UK, Russia, many of which are investing huge sums on the construction of “forests” of solar panels, however, what is a “solar panel”?

A solar panel is a collection of various semiconductors and plates, falling on which sunlight is converted into energy. The design of a solar panel is as follows [1]:

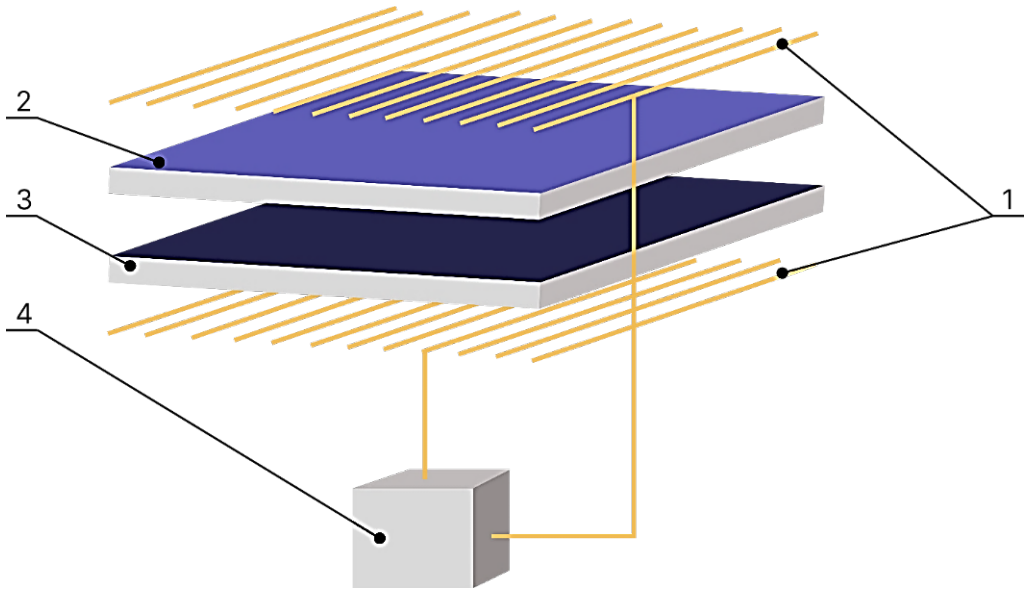


Figure 1. Construction of the solar panel

Modern solar panels are very simple in design, the main elements of any solar panel are the metal contacts on the top and bottom of the battery (1), the n-layer is a converter block consisting of silicon containing electrons (2), the p-layer is a similar converter block (3), and the load connected to both metal structures which draws energy from the solar panel (4).

The energy from such a structure is generated due to the silicon that makes up the main elements of the solar panel. The process is as follows: when the stream of photons from the sun rays hits the battery, it appears in the space between the two plates, where due to the heterogeneity of the crystals of the plates an EMF (electromotive force) arises as a result of the resulting potential difference electrons current appears, which is then fed to the load through the metal structures connected on both sides.

The principle of operation of modern batteries is based on discoveries made by the physicist Alexander Becquerel in 1839. It was at that time that the first semiconductor was invented, on the basis of which modern solar panels were created. From the inside, the process of converting sunlight into electricity looks as follows [2]:

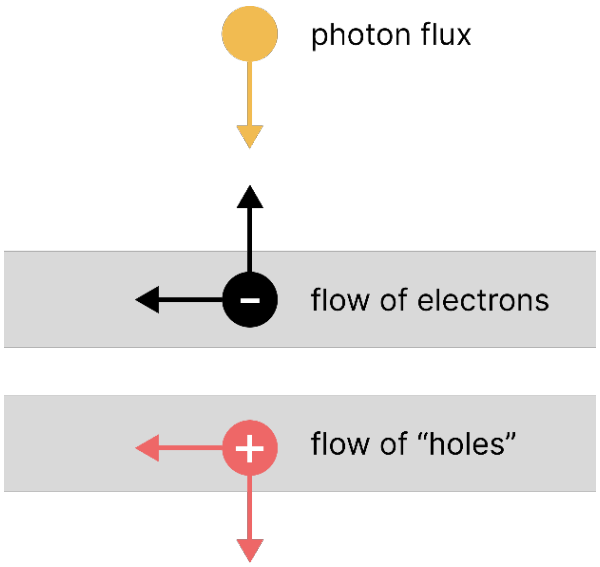


Figure 2. The transformation process of sunlight

Photons heat the top plate of the panel, electrons are released from the silicon atoms, the concentration of “holes” and electrons changes, which results in a potential difference. The cathode in this scheme is the top n-layer, the anode is the p-layer and the diode is the space between the two plates. Then the free electrons, striving to return to their original position, move along the conductors, giving their energy. This method of obtaining energy has a number of advantages:

1. Ease of manufacture;
2. Light weight;
3. No moving parts;
4. Reliability and maintainability;
5. Long service life;
6. Noiselessness;
7. Environmental friendliness.

However, on top of everything else, the use of solar panels has a number of significant disadvantages. Firstly, they are highly unstable and are mainly used only in hot, sunny areas. Secondly, each photovoltaic cell of which the batteries are composed is only capable of receiving a certain spectrum of solar radiation, and all the remaining energy is wasted, which significantly reduces efficiency. To neutralize this effect multistage solar panels are used, which consist of a cascade of PV cells, each of which receives its own spectrum, but this method leads to bulky solar cells and significantly increases the area occupied by the battery.

1 kWh per 1 mI is a constant indicating the amount of solar energy which reaches the ground at the temperature of 25 degrees Celsius and direct sunlight hitting the surface. The maximum possible efficiency from a solar panel is 24 %, which in terms of kW is 0.24 kWh, this value is not constant under changing weather conditions [3, p. 9-10].

At present, an innovative variant of solar panels is being developed: the solar panel-window. Several variations of such batteries are in development, but we will

consider the most promising one. The design of this solar panel-window is shown in figure 3 [4]:

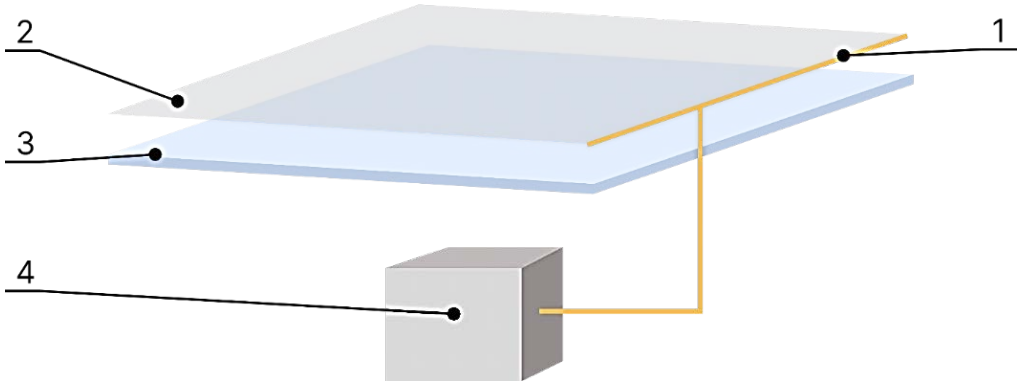


Figure 3. Construction of the solar panel-window

The construction of such solar cells consists of a transparent film of fullerene-rich semiconductor polymer (2), which is applied to glass (3). When sunlight hits this film, it generates electricity and transmits it to the contact (1), which in turn transmits the charge to the load (4).

The inner process of operation of this battery involves the use of organic semiconductors, which create bands that are invisible to the human eye but can reproduce electronic excitation within them. Many organic compounds are capable of absorbing light beyond the visible wavelength range. The basis for such panels is a non-fullerene molecule (NFA), which has the ability to absorb light in the near-infrared range. This technology is able to work not only with natural light, but also with artificial light. It is capable to produce electricity with an efficiency of 1 % in terms of the amount of electrical energy is 0.1 kWh/mI.

Very important aspects when creating these panels are light transmission, light efficiency and efficiency coefficient. As the panel is used as a conventional window, the light transmission should be at least 50 %. In order to find a compromise, the following solution was found: an optical coating consisting of the following layers was applied to the anode: C36H24N2 with a thickness of 35 nm, MgF2 with a thickness of 100 nm, and a layer of MgF2 bilayer with a thickness of 120 nm and SiO2 with a thickness of 130 nm [5]. This technique was able to increase the level of transparency to 47 % without losing its electrical transmission properties. Already now, the US concept SolarWindow uses methods to achieve a 70 % transparency and an efficiency of 7 %, which means a high-quality solar-window cell in the near future [6]. This technology is only in the middle of the development process, but we can already see the enormous prospects it has. On the basis of statistical data, we can calculate the approximate amount of electricity that could be generated in a city with houses equipped with these windows.

We can make such a calculation on the example of Saint Petersburg; the average number of windows in a 10-story new building is about 120 pcs. There are 19,177

buildings on the territory of Saint Petersburg according to the data provided by Dom.minZhKH for the year 2021 [7]. The electricity consumption in St. Petersburg according to RSPO for the year 2021 is 470,402.792 kWh [8]. We can take the available efficiency value of 1 % and get the following: 120 Ч19 177=2 301 240
Approximate number of windows in the city of St. Petersburg:

2,301,240 Ч0.1= 230,124 kWh

The amount of electricity generated in the city of St. Petersburg by the solar panel-windows. This is sufficient to produce 48.92 % of the electricity consumed per day. Surpluses, if any, can be accumulated in blocks – accumulators built into the panel, and on cloudy days electricity can be generated from artificial light.

Hence it can be concluded that, even with very low efficiency, the electricity generated by solar panels can compensate for almost half of all electricity costs. It should also be taken into consideration that they are easy to install and do not require additional space. In addition, due to the absorption of part of the light, buildings equipped with these windows will be exposed to less heat from the sun, which will reduce ventilation and air conditioning costs in the long term. In addition, this way of generating electricity is also completely environmentally friendly.

Summing up, we would like to note the prospects of this technology, because it can not only allow the city to provide itself with electricity, but using this technology, it is possible to construct electric cars, it can be applied in the production of smartphones, tablets, laptops and other electrical equipment, which can maintain its charge much longer. The list of its applications could go on and on, but the most important thing about it is its environmental friendliness.

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USING THE TOOLS OF TRAINING WORK IN THE PRACTICAL WORK OF A PSYCHOLOGIST

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Abstract. The activity of a modern psychologist is saturated with a large number of various cases. Each situation requires an individual approach and effective tools that contribute to achieving a positive result. The article presents enlarged methods and tools of training forms of work with people that help a practical psychologist achieve the goals of rehabilitation and assistance to participants in psychological interaction.

Keywords: psychologist, training, psychological training, training methods.

ПРИМЕНЕНИЕ ИНСТРУМЕНТОВ ТРЕНИНГОВОЙ РАБОТЫ В ПРАКТИЧЕСКОЙ РАБОТЕ ПСИХОЛОГА

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Аннотация. Деятельность современного психолога насыщена большим количеством разнообразных кейсов. Каждая ситуация требует к себе индивидуального подхода и эффективных инструментов, которые способствуют достижению положительного результата. В статье представлены укрупненные методы и инструменты тренинговых форм работы с людьми, которые помогают практическому психологу достигать стоящих перед ним целей реабилитации и помощи участникам психологического взаимодействия.

Ключевые слова: психолог, тренинг, психологический тренинг, тренинговые методы.

Training is a method of active learning that includes the development of certain skills and work in the field of social orientation. Psychological training is based on working in a team, which helps to establish contacts, better understand people and yourself using various tools [1].

Group psychological training includes various methods of work used:

- in clinical psychotherapy aimed at treating people who have received psychological trauma, who have a number of neurological problems, who abuse alcohol, etc.;
- in training for people who have psychological complexes, helping them to achieve the desired result.

The general goal of any training is to help people form skills about their actions, qualities, to reconsider their behavior from the point of view of psychology in order to

form the skills of internal reflection and awareness [2]. The goal also includes certain tasks that are aimed at improving communication skills, adjusting the system of relationships, and social orientation in work. Training technologies are based on two contradictory approaches that simultaneously complement each other: competent and experiential learning.

Training methods are a set of techniques and means aimed at realizing the goals and objectives of a specific training program [3]. At the same time, various problems of the essence of the use of psychological training in practical psychology are possible [4]. They must be remembered and preventively worked out.

Game methods constitute the "core" of the training process, the implementation of these games contributes to group formation, group dynamics [5]. Types of game methods: attestation; games for the development of group dynamics; didactic; imitation; innovative; research; operating rooms; organizational and activity; problem-oriented; career guidance; role-playing; warm-up; business; creative; managerial; educational, etc.

Characteristics of gaming methods of training. Most of the game methods involve the joint performance by the participants of any tasks assigned to a group or subgroups and, as a rule, require creative solutions. Role-playing and business games, in particular, those that involve work in subgroups, update interpersonal communication skills (role reversal), stimulate the activity of participants, their manifestation of creativity and originality, originality of thinking, which, among other things, contributes to group cohesion.

Debating methods in training work. Varieties of discussion methods – conversation, discussion, debate, debate, polemic, etc. The goals of discussion methods: to provide participants with the opportunity to discuss the problem from different angles, to develop a common opinion on the most acute, "hot" issues; eliminate emotional bias, stereotyped perception of the problem, etc.

In addition, they are a good diagnostic and self-diagnosis tool, which helps to easily identify communication difficulties and other psychological problems. Thanks to the game, the learning process is intensified, new behavioral skills are fixed, ways of optimal interaction with other people are developed. Games are also the springboard where the participant can easily and naturally try himself in a new role, reflect himself in it, and then transfer the conclusions made to real life.

The development of social perception. Thanks to their use, participants receive verbal and non-verbal information about how other people perceive them, how accurate their own self-perception.

Body-oriented methods, which include work on the body structure, sensory awareness and neuromuscular relaxation, as well as oriental methods (hatha yoga, aikido, etc.).

Meditative techniques are used to teach physical and sensual relaxation, relieve psychological tension or stress, and as a result come down to developing auto-suggestion skills and strengthening self-regulation methods.

Methods of feedback and psychodiagnostics, their meanings and features of use in training. Feedback in the form of information from the participants of the training makes it possible to obtain information about the quality and results of the training

procedures carried out, ongoing group processes, evaluates the effectiveness of the work of trainers, and the like.

Psychotechnical methods in trainings are aimed at creating a comfortable group atmosphere, changing the emotional state of the group members, as well as training various personal and communicative properties, primarily to increase sensitivity in the perception of the world around.

Experimental training methods are based on the creation of an artificial situation in which certain properties of an individual or group of people, as well as the skills and abilities to be trained, are highlighted, identified, evaluated and consolidated in the best way and presentation methods in training.

Presentation methods are methods of verbal and non-verbal presentation, designed to enhance the effects of perception and comprehensive understanding of theoretical, applied and practical issues on the topics of the training.

Thus, training, as one of the tools of psychology, in turn contains a wide variety of methods and techniques.

For the quality work of trainers, it is necessary to thoroughly and comprehensively scientifically explore the field of training education. Particular attention should be paid to the diagnosis of professional and pedagogical competencies of the leading trainings.

Including, first of all, it is necessary to conduct an in-depth analysis of the role of the leader and identify factors that increase the level of efficiency, create conditions for continuous development, strengthen the understanding of patterns and relationships aimed at the formation of personal, professional, pedagogical competencies and the maintenance of psychological and pedagogical competencies based on fundamental knowledge in the field of philosophy of education, pedagogy, psychology, state policy in the field of education, understanding the essential characteristics of social and economic processes in society through adequate understanding and use of one's own experience in professional activities.

A qualitative study of the current state of affairs in training education and the competencies of trainers, diagnosing shortcomings and creating a set of measures to eliminate them, will not only increase the effectiveness of training forms of education, but also create a unified scientific knowledge base in this area. The realities of modern training education allow us to make an unambiguous conclusion that the Russian training market is at a stage of active growth and in order to move to another qualitative level, a lot of work is required from the scientific and professional community in the field of methodologies, techniques, concepts and principles of training forms of education.

In the process of working on this article, the conclusion became obvious that training should be based on didactic, andragogical and active approaches and should basically use the principles of humanistic pedagogy.

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DIGITAL HEALTHCARE IN RUSSIA

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Abstract. At present, the introduction of modern information technology in various processes of the medical industry is becoming urgent. This article presents the possibility of digital transformation in healthcare. Examples of successful implementation of this innovation in Russia are also given.

Keywords: medical information system, digitalization, automation, neural networks, database, healthcare.

ЦИФРОВОЕ ЗДРАВООХРАНЕНИЕ В РОССИИ

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Аннотация. В настоящее время становится актуальным внедрение современных информационных технологий в различные процессы медицинской отрасли. В данной статье представлена возможность цифровой трансформации в сфере здравоохранения. Также приведены примеры успешного внедрения данной инновации в России.

Ключевые слова: медицинская информационная система, цифровизация, автоматизация, нейронные сети, база данных, здравоохранение.

During 2022, medical institutions set the goal of completely getting rid of non-digital medical equipment and paper workflow. Demand for personal gadgets with sensors used for diagnostic purposes is predicted soon. They allow you to track glucose levels, heart rate and even mood [1]. The received information is sent to doctors in real time, which allows for a more accurate diagnosis and treatment protocol individually for each patient.

Digitalization in the healthcare sector is accompanied by more convenient and faster access to medical care. Many experts have already seen the effectiveness of delegating health management to services. Also, for a more convenient and prompt

consultation, there is the prospect of a subscription model. Access to medical services is provided on an ongoing basis.

One of the most important events is the launch of the Personal Medical Assistant project. This project allows for remote consultations with specialists, prescribing treatment for patients with diabetes and cardiovascular diseases. Pilot projects have already shown the effectiveness of remote monitoring. Connecting an inhaler, a tonometer to the system significantly reduces the risk of subsequent hospitalization. Often, a serious condition can be prevented by adjusting therapy [2].

It is also worth noting such a project as the "Medical Information System (MIS)" - a set of software products, the main task of which is to automate all the main processes in the work of medical institutions. With the help of MIS, you can quickly and efficiently establish electronic document management, and organize work with patients in the most productive way (Figure 1).



Figure 1. Medical information system

The medical information system provides access to the creation of electronic structures for hospitals, their branches, departments or single rooms, unites a number of institutions into a single electronic system. It is easy and convenient to work with HIS, as they have flexible algorithms and intuitive reporting tools (Figure 2).

Due to the fact that MIS mainly consist of modules, it is possible to assemble and configure the system in the desired configuration for various institutions, as well as provide the necessary functionality that allows further addition or removal of modules [3].

You should pay attention to such a platform for monitoring and implementing the work of private medical institutions, dentistry and a number of clinics from Russian developers like Medods. This platform compares favorably with the presence of online records, the manager's desktop, support for marketing tools, integration with 1C and much more. It is important to note that technical and customer support is included in the purchase price of this system. User-friendly interface. But there are also several

disadvantages, such as the lack of support for multi-factor authorization, backup in several places and not providing trial access [4].

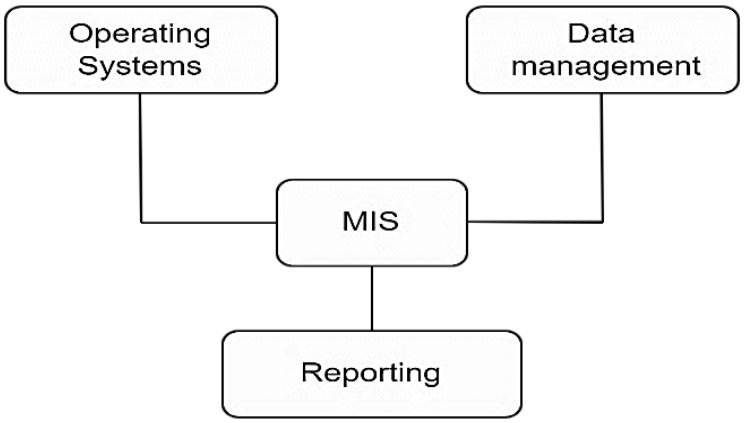


Figure 2. Structure of medical information systems

Artificial intelligence technologies will also be in demand in digital healthcare. When it is necessary to collect, systematize and analyze a large amount of data, neural networks will become an indispensable assistant [5]. In addition, algorithms are being actively developed today to help doctors solve a wide variety of problems: assessing the likelihood of disease complications, remote first aid and patient data collection, assistance in making diagnoses and prescribing treatment, and real-time data analysis of seriously ill patients [6].

It is worth noting that digitalization is needed not only for the treatment of complex diseases, but rather to get rid of the routine - according to a study by Sage Growth Partners, 90 % of medical institutions in the United States have already implemented algorithms or prescribed a plan for their implementation in the future. For example, patients at the Ohio State University Wexner Medical Center can get to the doctor without a single call and review their medical records at any time. In Moscow, patients received the possibility of self-remote recording and access to an electronic medical record, and not within the framework of one hospital, but the entire city.

Digitalization of healthcare is a necessary part of modern medicine. The use of a set of software products has a number of advantages. Institutions will finally get rid of filling out paperwork, duplicating entries and entering information into other documents. The risk of losing medical records and other important documents is reduced to zero, which increases the likelihood of successful patient treatment. Patients will be able to have access to their data, quickly receive the results of all tests, maintain remote communication with the doctor, and, thanks to advance booking, avoid queues for appointments.

Especially digital systems have shown their effectiveness in Moscow during the pandemic. All medical institutions around the world are facing the same challenges - a huge number of patients, a lack of resources, and routine operations that must be performed manually when patients need help. Scientists and doctors began to use technology in order to win the race against time for the lives of patients.

Moscow was ready for such a challenge thanks to the digital maturity of the capital's healthcare. This helped in a very short time to create a digital system that helps each patient in a personalized way at all stages of treatment for coronavirus.

The basis of the digital platform is the laboratory diagnostics service for COVID-19, which was created in less than a month and included 600 institutions, both city and private and federal institutions. This made it possible to have a single up-to-date database of all residents of Moscow with a confirmed diagnosis. Another important information service is the unified digital register of patients with coronavirus infection, which includes about 250 healthcare organizations. It provides personalized accounting, routing and management of patients from the moment the virus is detected. The register is available in real time to all parts of the healthcare system.

Here's how it works: once a patient's diagnosis is confirmed, data on the severity of their condition is entered into the registry. Contact them and check the status. An ambulance goes to seriously ill patients, and the treatment of patients with symptoms of acute respiratory viral infections or pneumonia that does not require hospitalization is carried out by a telemedicine center.

Artificial intelligence (AI) also came to the aid of doctors – using new technologies, radiologists got the opportunity not to miss pathologies in a large stream of studies and to quickly determine the stages of development of pneumonia on CT scans of the lungs [7].

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УДК 336.7

FACTORING AS A NEW BANKING SERVICE

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Abstract. In this article we will look at what factoring is, tell you about its participants in the transaction, types and functions, explain that equating factoring with a loan/assignment is unacceptable. We will also consider the application of factoring in practice and compare it with other banking tools for providing credit services.

Keywords: factoring, banking services, supplier, buyer, factor.

ФАКТОРИНГ КАК НОВАЯ БАНКОВСКАЯ УСЛУГА

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Аннотация. В данной статье рассматривается, что такое факторинг; рассказывается также о его участниках в сделке, видах и функциях; дается объяснение, почему приравнивание факторинга к займу/уступке недопустимо. Ракрывается применение факторинга на деле и дается сравнение его с другими банковскими инструментами предоставления кредитных услуг.

Ключевые слова: факторинг, банковские услуги, поставщик, покупатель, фактор.

To finance short-term operations of enterprises, such a financial instrument as factoring is practiced. The relevance of this topic lies in the high rates of factoring development worldwide after the tightening of lending requirements. Factoring has advantages over other services due to the absence of collateral requirements and the targeted use of funds.

Factoring is a financial instrument or banking service with which the buyer can purchase a product or service with deferred payment, and the supplier can receive a package of services from the factor, which includes an advance of revenue, protection against the risk of non–payment, accounting for accounts receivable [1].

In factoring, there are three participants in the transaction, which are considered in table 1.

Table 1 – The subjects of the factoring transaction

	Role	*Factoring result*
The supplier	Seller of goods or services	Timely receipt of revenue
Buyer	A person purchasing goods or services	Deferred payment
Factor	Factoring company, bank or micro-credit company providing factoring services	Commission

Let's consider the role of participants in a factoring transaction on the example of a supplier who sold a product or provided a service to a buyer, but the payment deadline has not yet arrived. Where did the supplier get a monetary claim that he can concede to the factor in order not to wait for the payment deadline, not to remind the buyer of the need to pay his bills or protect himself from non-payment by the buyer.

The types of factoring are distinguished by the tasks that factoring helps a business solve. Types of factoring [2]:

− Internal and external;

− With and without regression;

− Open and closed.

Factoring also has a number of main functions: timely financing of the supplier, administrative management of accounts receivable, assessment of the solvency of buyers and risk insurance [3].

Factoring is quite widespread and well-known in the world, but there are a large number of entrepreneurs who equate it with a loan or a cession. However, equating factoring with credit is unacceptable. Note that the contract in the factoring transaction is indefinite, has no collateral, purpose of funds and financing within the limit, unlike a loan. Contrary to the similar aspects observed in factoring and assignment contracts, factoring service is a separate type of settlement. Also, factoring services are provided only by commercial companies, there is a monetary assignment of rights and a huge range of services for managing accounts receivable, and not the usual redemption of claims [4].

It should be noted that factoring is provided on more favorable terms for suppliers of goods. As for factoring and assignment, they are two separate financial instruments that have different characteristics to each other.

Let's consider the practical application of factoring and compare it with other banking tools for providing credit services. Epidemiological instability contributes to the development of this type of services, since factoring financing is more affordable than credit.

In Russia, specialized factoring companies can offer revenue collection and its advance payment, a range of services for managing accounts receivable. Most

commercial banks offer factoring services: Sberbank Factoring, RTS-Capital, National Factoring Company, Factoring Plus, Metallinvestbank, PSB Group, Alfa-Bank, FG Prime, Otkritie Factoring and others.

To understand the principle of operation of a financial instrument and the expediency of popularizing this type of financial services, consider the following example and make several calculations.

For a good example, let's take the company OAO Lebedyansky, a Russian food processing plant recognized as the leader of the juice market. The plant buys apples and peaches from the agricultural firm "Jubilee", then squeezes the fruit into juice and gives it to various retail chains for sale, which will receive revenue only after the sale of the goods – in four months. The company "Jubilee" works on the terms of one hundred percent prepayment, only in this case the company sells apples and peaches to the plant.

Due to different time intervals for the purchase of raw materials and income for the sale of manufactured juice, the plant may have a cash gap: the need to pay 500,000 rubles for the supply of fruit, provided that revenue of 700,000 rubles for the juice sold has not been received.

There are several options for overcoming the cash gap, the first option is a commercial loan that Sovcombank can approve, but for approval it is necessary to make a deposit or find a guarantor to secure the loan. The bank also sets a condition that it will issue at least 600,000 rubles and the plant will have to pay off the loan and 25 % on top of the loan amount. Taking into account such a financing scheme, the plant will lose 150,000 rubles and receive an additional 100,000 rubles, which it will not invest in the next delivery. However, the bank does not agree to other conditions and for a smaller amount.

Another option is that the plant will concede the right to receive money from retail chains to a bank in the amount of 570,000 rubles, while the plant will lose 130,000 of juice revenue. For a smaller amount, the bank will not agree to buy the debt, because it risks: the buyer may not buy all the goods online, which will bring a loss to the bank. This is a contract of assignment of a claim, not factoring.

The third option is a compromise option, when both sides are interested in paying off the debt. The bank will pay 500,000 rubles to the plant, and will give the remaining amount of 200,000 rubles after receiving the entire amount of debt, and for this the plant will pay a commission of 50,000 rubles. Here both sides will benefit, but in addition to the direct financial benefit, there is another one. We understand that the plant does not have the resources to recover the debt if the networks do not pay the debt on time. The bank's economists will control the terms of payment for the goods and in case of arrears, lawyers will be involved to recover the delay. The plant will save on personnel, because it will not need to involve a lawyer and an economist. This procedure illustrates the factoring service: the bank buys the right of claim and provides debt repayment services. This service with deferred payment for a period of 30 days will cost the plant 94,500.

To determine the amount of payment for the service of a financial organization, represented by Sovcombank, it is necessary to know the following terms of cooperation: the annual profit of the plant (8,400,000), an advance payment (70 %), the interest rate for the advance (15 %), the residual amount (30 %), the commission for the work of the factoring organization (3 %).

1) Accounts receivable for 30 days: 8,400,000 / 12 = 700,000

2) Commission for the service, payment for one delivery: 700 000*3 % = 21 000 (for 12 months 246,000)

3) The percentage for using the advance depends on the initial payment: 700 000*0.7 = 490 000

4) Interest payment on it 490,000*0.15=73,500

5) Total amount for the service: 21 000+73 500 =94,500

The table 2 shows the costs of the plant in three cases, let's compare the most profitable options. When choosing a factoring service, the plant will save up to 55,500. The only condition is that Sovcombank calculates a percentage for the service for 12 months of the plant's operation, but the amount of 319,500 rubles will quickly pay off due to timely receipt of amounts in accordance with payment documents, since the amount can be immediately put into circulation and used in production. Thus, the savings will amount to 37 % of the loan costs and 27.3 % of the payment assignment agreement.

Table 2 – Expenditure items of OJSC Lebedyansky on debt in comparison

Credit	*Payment Assignment Agreement*	*Factoring*
150 000	130 000	94 500

Thus, after defining the concept of factoring, considering its types and functions, as well as after identifying the difference between factoring and a loan/assignment, we came to the conclusion that factoring is a tool widely used when it is necessary to defer payment and control the payment of receivables. Factoring is an alternative to international trade finance and the advantages it offers are of interest to international trade participants. With the help of factoring services, the company will be able to enter the international market with less risks and costs, and in the domestic market receive a range of services from the factor to fulfill debtors' obligations.

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EFFICIENCY OF WEATHER-DEPENDENT REGULATION OF AUTONOMOUS HEAT SUPPLY SYSTEMS

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Abstract. The concept of microclimate in a residential area is primarily associated with maintaining a comfortable temperature. In autonomous heating systems of individual houses or apartments, the concept of "comfortable temperature" is determined by the subscriber himself. This article touches upon the issue of the effectiveness of "weather-dependent" automation for controlling autonomous heat supply systems of low power.

Keywords: automation, regulators, heating, heat supply system.

ЭФФЕКТИВНОСТЬ ПОГОДОЗАВИСИМОГО РЕГУЛИРОВАНИЯ СИСТЕМ АВТОНОМНОГО ТЕПЛОСНАБЖЕНИЯ

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Аннотация. Понятие микроклимата в жилом помещении в первую очередь связано с поддержанием комфортной температуры. В автономных системах отопления индивидуальных домов или квартир понятие «комфортная температура» определяется самим абонентом. В данной статье затрагивается вопрос эффективности «погодозависимой» автоматики для управления системами автономного теплоснабжения невысокой мощности.

Ключевые слова: автоматика, регуляторы, отопление, система теплоснабжения.

Modern scientists are working with engineers to find ways to improve the efficiency of heating systems in order to reduce the negative effects on the environment. One of the ways to solve this problem is weather-dependent automatics, capable of controlling heating systems. This group of devices is able to control the fuel consumption, in the running unit, taking into account the current changes in the weather. At the same time, it is possible to predict excessive cooling or excessive temperature in the heated room in order to immediately compensate for possible

deviations. The work performed by the weather-dependent automatics is aimed at maintaining an optimal balance between a comfortable microclimate and economical mode of heating operation.

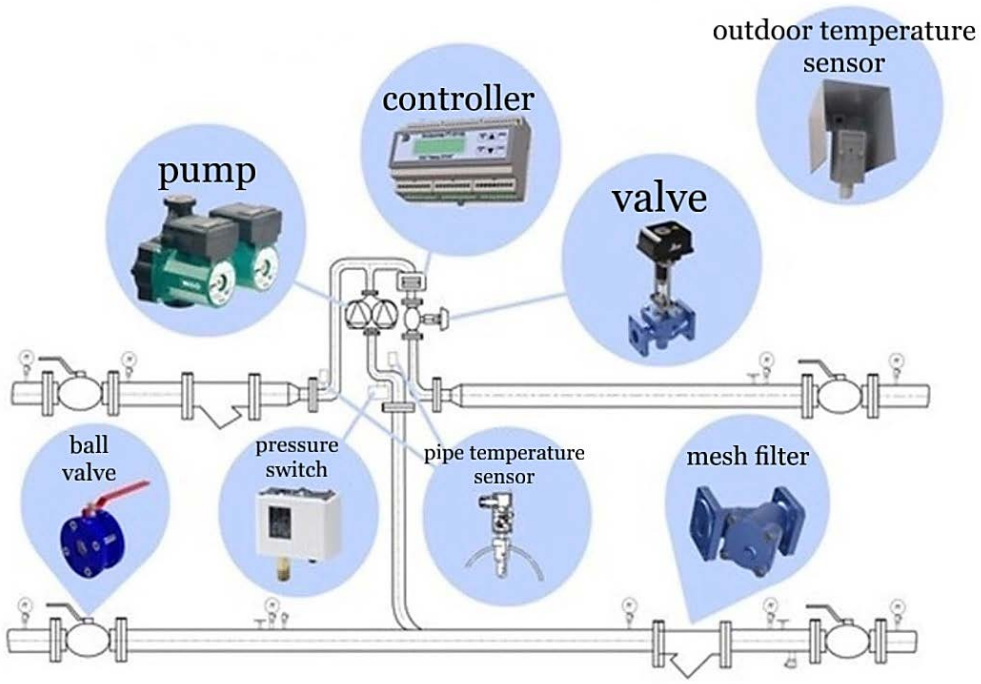


Figure 1. Composition of weather-dependent control unit

The weather-dependent system (Figure 1) is able to control the heating based on the current weather changes, represented by a number of basic elements: control controller, temperature sensors, elevator – regulating valve equipped with a pump. The control controller, which regulates the temperature, makes the change of heating mode, based on the data transmitted by the sensors that register changes in temperature: outdoor temperature sensor, room sensor, boiler supply sensor, return sensor. Considering the difference in temperature readings of all sensors under control, the control system selects the optimal mode of operation of the heating unit. Weather-independent automation controls the heating system based on the readings of four sensors, which allows you to achieve significant (up to 20 %) energy savings by making a smooth change in temperature mode in advance [1].

When you set the controller, you set a temperature schedule (Figure 2), which is designed to regulate the temperature of the heating water depending on the outdoor temperature. When the outdoor temperature is relatively high, it is necessary to reduce the heating water for heating various buildings and premises, thereby saving energy resources: gas, electricity. Values of temperature schedule points are set in the control device (controller), which in turn continuously measures the temperature of the outdoor air and heating network, and then sends signals to the regulating valves (three-way valve). PID control of the three-way valve is performed. When the outdoor temperature changes, the controller sends short-term pulses to close or open the three-way valve, increasing or decreasing the flow of hot water into the heating system. The presence of

room temperature sensors and outdoor temperature sensors allows you to accurately monitor and promptly correct the temperature in the rooms of the house.

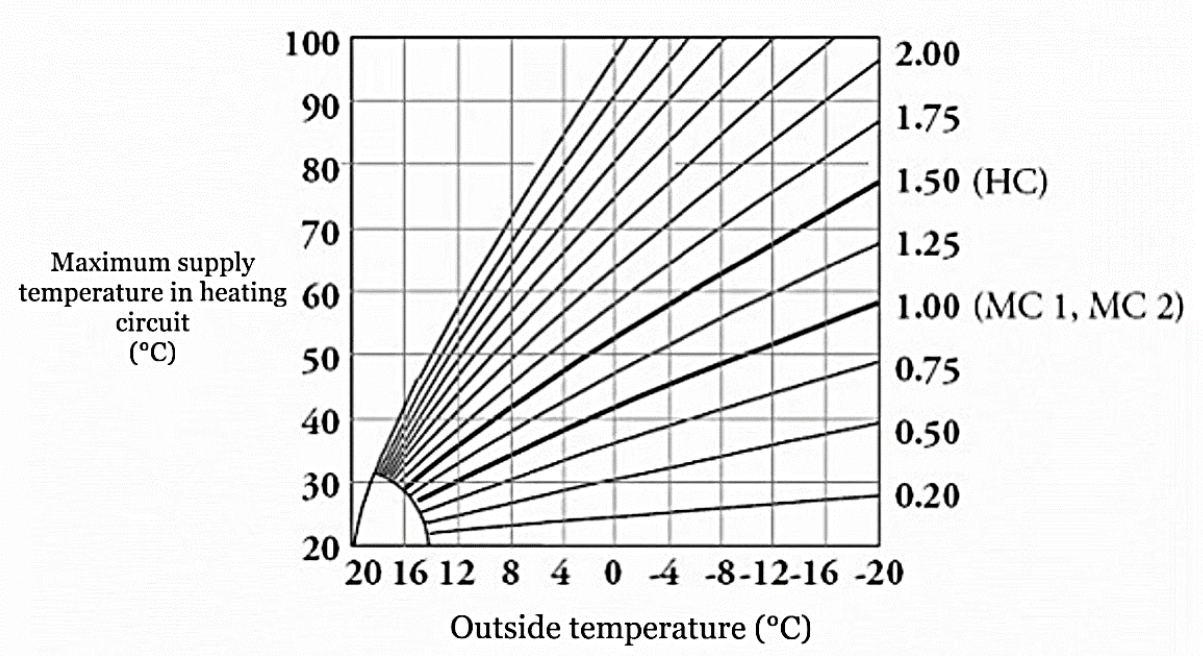


Figure 2. Heating curve diagram

Weather-dependent automatics has a number of features for installation. The main ones are the choice of installation location of the external and internal temperature sensor. An important aspect of the thermostat application is fuel saving. For example, in the room where the sensor is installed, the temperature has increased by 2°C due to the natural heat loss of people [2]. The control panel recognizes these changes and gives a command to reduce the temperature of the heating medium in this circuit, although the outdoor sensor may require just the opposite. Reduction of heat consumption for heating of this room naturally saves fuel.

Install the external sensor so that it is protected from direct sunlight. It should also not be blocked from the wind by any building structures. The sensor should be placed off the wall of the house so that the heat loss does not affect its readings.

The indoor sensor is installed in a reference room. It should have an average temperature in the house, and its fluctuations should be minimal. The room should not be crowded and the use of a fireplace is undesirable. It should not be in direct sunlight or near the front door. A bedroom or children's room is best suited for these conditions. Controlling the heating based on temperature sensor readings only inside the house means high inertia [3]. If there is a sudden cold snap, especially with quality insulation, the temperature drop in the house will occur with a noticeable delay. When the automatic control system responds, it will have to run the boiler at maximum capacity to compensate for the temperature drop. When it gets warmer, the opposite effect will be observed – the boiler will be activated on low power with a delay, and the house will be hot.

While in private homes the system directly controls the output of the boiler, in large apartment buildings or public buildings the system controls the operation of the return valve, allowing more or less of the spent coolant back into the heating circuit.

Connecting the controller to the system "smart home" significantly expands the possibilities of heating control. In addition to the operation of heating under the control of the controller of weather-dependent automatic system the owners have the opportunity to remotely adjust the temperature mode in the rooms. The main condition here is the connection of the controller to the Internet and installation on mobile devices of special applications for controlling home life support systems. For example, weather-dependent control systems (Buderus EMS Plus, Buderus Logamatic 4000 (Figure 3) and 5000) allow for automatic mode [4]:

− to control several heating circuits and cascade boilers;

− control each circuit independently – maintain a certain temperature of DHW, underfloor heating or pool water heating;

− additionally, regulate the heating operation and depending on the room temperature. The algorithm calculated on the basis of the values of the outdoor sensor is corrected while taking into account the room sensor temperature in the room;

− set daily and weekly programs.



Figure 3. Weather-dependent control systems Buderus Logamatic 4000

A number of Buderus Logamatic models support the possibility of remote heating control. All these options not only provide the most comfortable conditions for the residents of the house, but also save energy resources.

The graph (Figure 4) determines the effectiveness of the application of weather-dependent regulation. The first operating mode shown on the graph is a constant correction of the coolant temperature according to the outdoor air sensor (automatic mode). In the second mode of operation changes in the outside air temperature by days during a month are taken into account. This is the same mode, when the owner has the ability to manually or remotely adjust the temperature of the coolant every day. The third mode of operation implies manual adjustment of the system at the time of a sharp change in the outside temperature. The fourth mode of operation is the complete absence of any regulation of the coolant temperature. It is assumed that the heating system operates at full capacity during the entire heating period. The results of

calculation of the consumed heat energy during the heating period for different types of regulation are summarized in the graph shown in figure 4 [5].

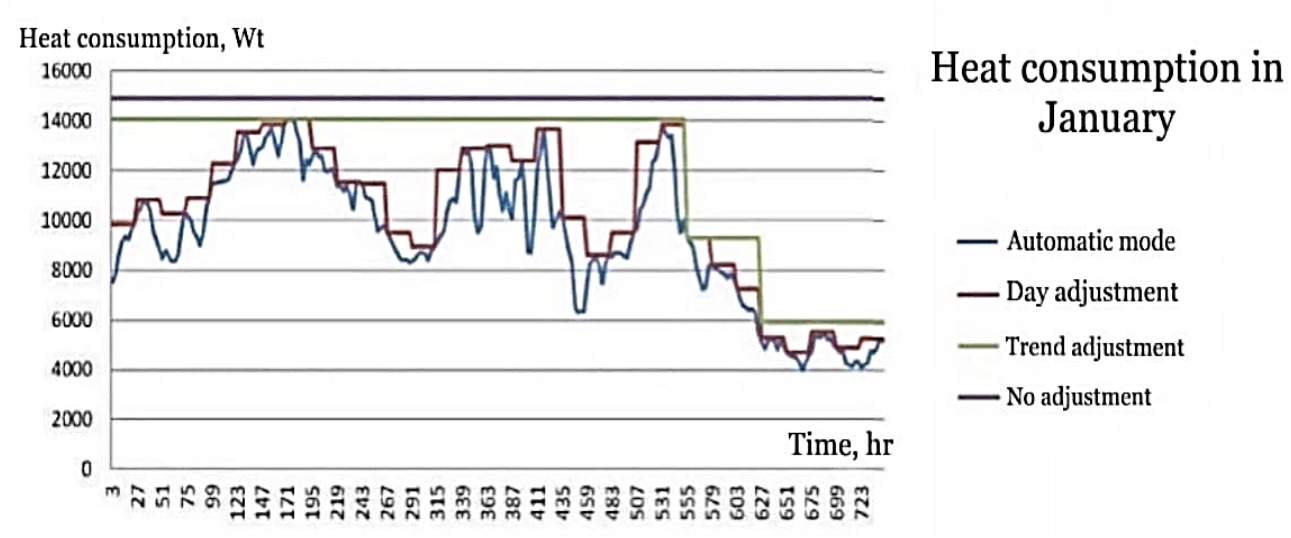


Figure 4. Heat consumption during the heating period for different types of regulation

Having analyzed the above results, it should be noted that the weather-dependent regulation is a justified measure, which allows not only to increase the degree of comfort, but also to save a significant percentage of money. Nowadays, only a modern temperature control system can significantly reduce the cost of heating and at the same time create the most favorable temperature background in the house. This effect is achieved by optimizing the work of all components of the heating system, as well as maintaining a set temperature of the coolant in the circuit.

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USING NEUROGRAPHICS AS A CREATIVE PSYCHOLOGICAL PRACTICE TO INCREASE PRODUCTIVITY IN THE FIELD OF FREELANCE

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Abstract. The article presents the study of the creative component in the sphere of freelancing. Freelance employment of young people as a social form of creativity is considered. The neurographic method is described as one of the methods of psychological practices aimed at increasing concentration and productivity. The study is based on the works of Russian and foreign psychologists.

Keywords: freelancing, youth, neurographics, psychological practice, self-actualization, social creativity.

ИСПОЛЬЗОВАНИЕ НЕЙРОГРАФИКИ КАК ТВОРЧЕСКОЙ ПСИХОЛОГИЧЕСКОЙ ПРАКТИКИ ДЛЯ ПОВЫШЕНИЯ ПРОДУКТИВНОСТИ В СФЕРЕ ФРИЛАНСА

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Аннотация. В работе представлено изучение творческой составляющей в сфере фриланса. Рассматривается внештатная занятость молодежи как социальная форма творчества. Описан метод нейрографики в качестве одного из методов психологических практик, направленный на повышение концентрации и продуктивности. Исследование опирается на труды российских и зарубежных психологов.

Ключевые слова: фриланс, молодежь, нейрографика, психологическая практика, самоактуализация, социальное творчество.

In modern economy active development and introduction of information technologies led to changes in traditional forms of labor organization, appearance of new, flexible forms of employment, among which freelancing occupies a special place. In the current crisis conditions, more and more young people in Russia are choosing this form of employment.

Freelance is a remote work on the Internet. A freelancer is a free worker who performs his work independently of any organization. This system works in the following way: a certain employer puts a specific task on the site, for example, to come up with a slogan, create a website, hold a webinar on some topic to his staff, etc. and sets a price for this work. Freelancers send their bids to this request. It includes a deadline for submitting the work and the cost. If the employer is satisfied with the freelancer's proposals, he begins his work. The peculiarity is that each freelancer on the site has his own characteristic, which is formed with the help of employers' reviews. The freelancer has his portfolio, which contains all his work. Therefore, freelancing is always associated with a share of creativity and independent work.

At present the market of freelance services is rapidly developing in the CIS (commonwealth of independent states) countries and Russia, attracting more and more new participants both from performers who offer their services, and from individuals and organizations willing to cooperate on a remote basis. Statistics of youth employment notes that the new generation prefers to work remotely, having more free time and space for creativity [1, p. 15]. This is exactly what freelance employment can offer.

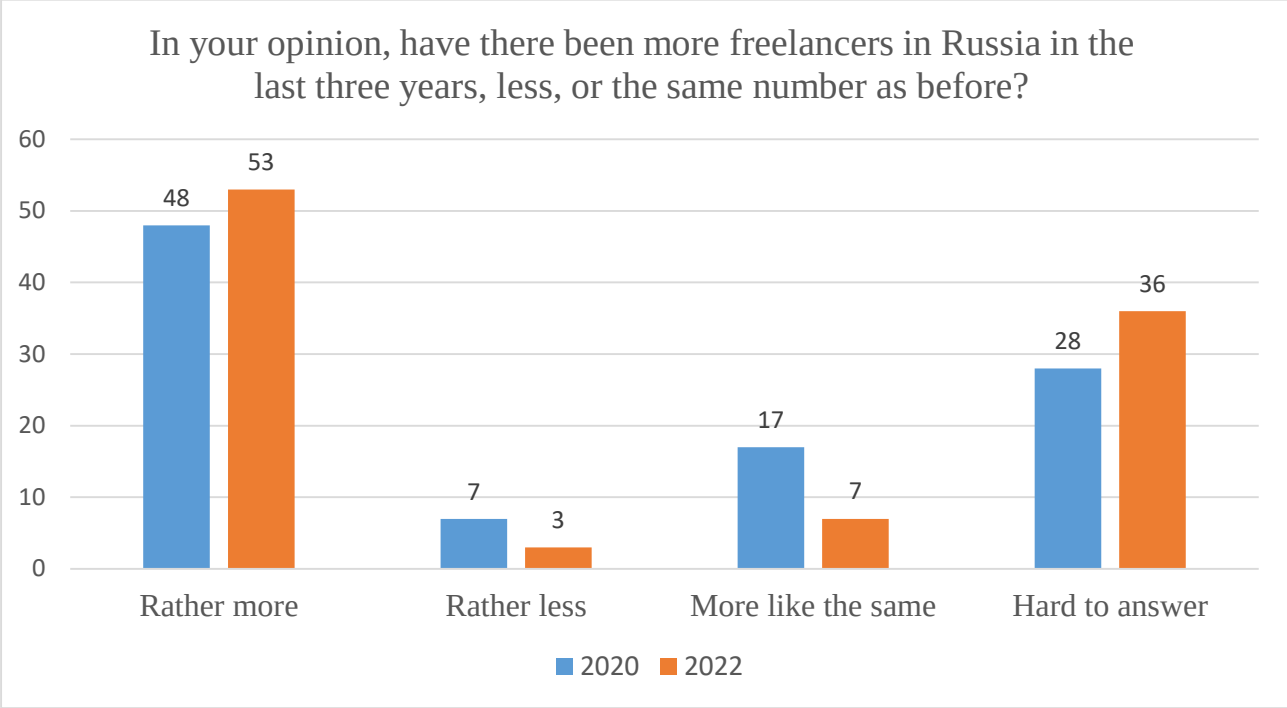


Figure 1. Survey of Russians about the number of freelancers, comparison of responses in 2020 and 2022, in % of the number of respondents. Compiled from WCIOM materials [2]

According to the All-Russian Center for the Study of Public Opinion, the number of freelancers in Russia increases every year (Figure 1). This testifies to the necessity of studying this phenomenon, including methods of increasing the productivity of such a creative profession.

Creativity manifests itself in all spheres of freelancer's life. Freelancing can be considered as a form of social creativity, when an employee independently creates the space (topos) of his/her own life and own activity, organizes communication with society both in the real and virtual worlds. It can also be considered as managerial creativity, when a person builds his life chronos (creates an individual time management system), the trajectory of his life, self-determines and reveals his potentials (self-actualization) and finds his individual way of realization.

This is confirmed by the statements of K. Rogers that the main motive of human activity is the desire for self-actualization, which contributes to the disclosure of the self. This aspiration has an innate character, and its realization is greatly influenced by a person's creative attitude. The modern level of development of science and technology puts forward the requirement of indispensable creative adaptation to the new world, and the creativity itself is an integral part of human self-actualization [3, p. 388].

Managing oneself and one's life is social creativity. In the book “The Human Soul” E. Fromm defines creativity as the ability to wonder and learn, to find solutions in non-standard situations, it is a focus on discovering new things and the ability to be deeply aware of one's experience [4, p. 119].

Young people engaged in freelancing need inspiration to organize their activities. Inspiration is a creative lift, a burst of creative energy. It is characterized by increased general human activity, emotional lift [5, p. 126-127].

Creative “burnout” is one of the urgent problems of young people engaged in freelancing. Deloitte research also reflects that professional burnout has become a widespread problem in recent years: 77 % of respondents experienced burnout at their present job, and every second respondent stated that this condition recurs; young people are more susceptible to burnout (84 %) [6, p. 91].

This system of work has several disadvantages that affect the “burnout” of the employee:

1. Unstable income. Quite controversial, in fact, especially for a freelancer with a portfolio and experience. This is the point most often cited as the main argument against remote work.

2. Remote work is not only pleasant, but also around the clock. Freelancing is not just a way to work via the Internet, it's a way of life. Therefore, sooner or later the adept begins to develop typical diseases and habits. If all of this is neglected, it is fraught to start falling down in six months from the acquired chronic diseases and exotic ailments. Although, in the office it is even easier. The only difference is that freelancers are often fans of their work, for it is very problematic to endure such a madhouse without the corresponding love.

3. Develops reclusiveness and sociophobia. Unlike the office employee, the freelancer's circle of compulsory communication is severely limited. There are still customers. However, often, even with them all communication goes through social networks, mail and Skype.

4. Workers are responsible for the results 100 % yourself. This is an obvious disadvantage, but it allows freelancers to keep themselve in a healthy tonus and develop personally. No additional incentives are needed.

5. No employer's social security. Freelancers are not entitled to insurance or sick pay. People will have to put up with it. By the way, no one will bring cookies to their house either. Deadlines are the most important for them.

6. The constant stress of having to learn something new. Remote work and freelancing do not tolerate stagnation. The disadvantages of this approach are a constant search for new tricks and gaining a unique experience, because everything changes at lightning speed. Freelancers have to constantly look for new sources of inspiration.

Modern practical psychology speaks about a possibility to get out of this state with the help of creative coaching practices. Neurographics can serve as an example of such creative practice. The author of this method, professor P.M. Piskarev, calls neurographics the practice of positive change, and the method itself the method of reality transformation.

Neurography influences a person by means of its assets [7, p. 64], the main of which is the neurographic line (Piskarev's line). It mobilizes the unconscious part of the psyche in which the source of creativity is located. K. Jung argued that the unconscious is full of germs of future mental situations, new thoughts, creative discoveries. It is a source of creative gift, creative inspiration [5, p. 15].

According to the pyramid of consciousness developed by P.M. Piskarev, neurography helps to mobilize and release creative energy to solve urgent problems by influencing unconscious processes. The more lines, the more unpredictable the result of work on a subject (including brain work). With the help of neurographic lines a freelancer can discover new resources to work with and start solving certain tasks [7, p. 71, 74].

Another significance is the neural model or Piskarev's principle, which is a unique technique of connecting lines, figures and objects consisting of rounded corners [7, p. 76]. The application of this principle allows to resolve internal conflicts at the subconscious level, which can hinder the expression of creative energy.

The third fundamental element of neural mapping is the basic algorithm (Piskarev's algorithm). This algorithm is invariant and consists of a number of steps: object selection, image formation, rounding, integration, field line adjustment, object fixation and control. Using the basic algorithm, one can change one's beliefs and attitudes, which can certainly help one work more effectively and even get out of conflict situations in work tasks. The basic algorithm is the basis for all other algorithms and techniques [7, p. 78].

In addition to the presence of neurograms, the psyche is also influenced by the numbers used in composing neurograms (circles, triangles, squares) and the colors used in the integration process. Each figure has a symbolic and mythical influence on the subconscious: coordination (circle), activation (triangle), stability (square) [7, p. 78].

Consciously using the energy of colors, freelancers can direct the process of achieving goals in the right direction. The philosophical understanding of colors in neuroscience is based on Wu Xin's theory of five elements, in which each basic element corresponds to a certain color scheme and, therefore, to a certain type of energy. By adding one or another color to his compositions, the worker consciously builds the realization of his projects, strengthens, harmonizes, activates or decreases his creative energy, learns to manage it, use it to realize his plans and organize his creative efforts.

Thus, neurographics, based on modern scientific knowledge, allows to activate human creative potential, to develop productivity and concentration for effective and fast realization of projects.

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THE IMPORTANCE OF THE ENGLISH LANGUAGE FOR STUDENTS OF TECHNICAL SPECIALTIES

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Abstract. The role of the English language for students of technical specialties is considered in the article. The importance of the English language is discussed, the knowledge of which allows to acquire important autonomous learning skills and be successful in the professional field in the future.

Keywords: foreign language, English, professional tasks, highly qualified specialist, motivation.

ЗНАЧИМОСТЬ АНГЛИЙСКОГО ЯЗЫКА ДЛЯ СТУДЕНТОВ ТЕХНИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

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Аннотация. В статье рассматривается роль английского языка для студентов технических специальностей. Обсуждается значимость английского языка, знание которого позволяет приобрести важные навыки автономного обучения и быть успешным в профессиональной сфере в дальнейшем.

Ключевые слова: иностранный язык, английский язык, профессиональные задачи, специалист высшей квалификации, мотивация.

The second half of the XX century was the time of the "triumphal march" of the English language on a global scale. Perhaps, back in the middle of the XIX century, few people could have imagined that this language, formed from dialects spoken by Germanic tribes who migrated to Britain in the early Middle Ages, would become dominant in the world economy, science and technology, diplomacy in a few decades, a carrier of cultural influence spreading to almost all countries of the world. Today, approximately 400 million people living in the United States, Great Britain, Canada, Australia, New Zealand and some other countries consider English to be their native language. But many more people – more than 1 billion, and according to some

estimates, 1.5 billion people – use English as a second or third language in work and life. In modern society, English is widely used in education, tourism and business, intercultural communication, production, politics and many other industries [1].

The improvement of university language training in non-linguistic, including engineering and technical, specialties is one of the directions of modernization of higher education, the relevance of which today no one doubts. Among the factors that actualize the study of a foreign language by students of non-linguistic specialties, researchers name: the processes of globalization in the modern world, including in the professional sphere and in education; the dynamic development of innovative technologies in the international scientific and technological space; the transition to an "information" civilization that requires any specialist to be ready to go beyond the limited, familiar the processes of modernization of education and the development of new technologies of education at the university.

As M. V. Dementieva notes [2], in modern Russia, the study of foreign languages, in general, is aimed at meeting the social and personal needs in learning these languages by various categories of students. Obviously, one of the tasks of the development of university language training is to harmonize the corresponding "social and personal needs". At the same time, in relation to non-linguistic specialties and areas of training, it is the social needs associated with the need for a specialist to use a foreign language in certain situations that play a leading role. Such situations may include:

− professional training with foreign specialists, including in the form of participation in international educational programs under academic mobility programs;

− work in foreign companies, international collectives;

− participation in international projects, grants;

− interaction with foreign partners on various production issues;

− prompt solution of production tasks requiring the involvement of a foreign language;

− exchange of professional knowledge and professional experience with foreign colleagues;

− obtaining up-to-date knowledge from foreign language sources.

The use of a foreign language by a highly qualified specialist can be aimed at solving a wide variety of professional tasks, including:

− preparation of reporting and marketing materials, oral presentation of a product or service;

− negotiating with foreign investors, communicating with non-specialist foreigners on issues of their professional activities;

− conducting a professional conversation with the meaningful use of foreign language terminology; orientation in the basic laws of corporate relations in foreign organizations;

− use of regulatory documents of foreign partners; preparation of internal documents for the tasks of interaction with foreign partners;

− identification of potential or hidden conflicts in relations with foreign participants of corporate relations;

− advise other specialists in the field of interaction with a certain foreign partner.

When teaching English in higher education institutions, motivation plays a crucial role. It is known that a student's indifferent attitude to study can lead to poor academic performance. Motivation is an incentive to action; a dynamic process of a psychophysiological plan that controls a person's behavior, determines his orientation, activity and stability.

The problem of teaching English in technical universities has been analyzed by many scientists for a long time. Its relevance does not decrease to this day, since the banal memorization of vocabulary without context has exhausted itself. Therefore, there is an urgent need to define a new teaching methodology aimed at the formation and development of the student's communicative function.

When teaching students, the following features should be taken into account:

− request for training;

− the student himself, on the basis of clearly defined professional plans and career aspirations, is active and understands what exactly he needs from new knowledge and skills;

− the need for justification (meaning), i. e. why it is necessary to study this course or section, an explanation of the relevance of the problem under study;

− the need for independence;

− possibility of independent choice from several alternatives;

− life experience of students;

− an urgent need for training;

− practical orientation of training [3].

The teacher helps students to understand how the knowledge will be useful to them in life and this subject will be important for their future profession and activity. Students need to be motivated not for an assessment, but for a result.

The main purpose of learning a foreign language in technical universities is verbal professional communication, reading and translation of specialized literature. In this regard, discussions and dialogues on a given topic, listening, watching authentic scientific films, retelling scientific and technical texts and making presentations are more effective forms of educational activity in English classes. The next type of educational activity includes translating the read text, performing grammar exercises and memorizing vocabulary with context. This requires the daily work of the teacher to select the material suitable for classes. It is impossible not to mention another way to improve the understanding of speech and communication, which can complement the main ones, is listening and learning authentic songs. It is also very effective to view news on well-known international sites. Thus, on the one hand, students learn new facts, and on the other – expand vocabulary and grammar knowledge. Also, as an independent work, a student can watch entertainment, sports programs in a foreign language, read fiction in the original. All these forms of educational activity contribute to the improvement of students' oral speech, regardless of the level of language proficiency [4].

The main purpose of studying at the university is to prepare the student for future professional activity. In the process of learning, the student not only assimilates information, but also trains memory, develops logical thinking, develops various skills and abilities. Despite the fact that some of the information acquired in the learning process may not be in demand in subsequent professional activities, the formed skills are preserved and can be used if it is necessary in the future.

It is no coincidence that graduate students must pass an exam in a foreign language. Along with other fields of knowledge, the study of foreign languages contributes to the activation of mental activity, which, in addition to the assimilation of knowledge, leads to the development of intelligence. The activity of learning a foreign language at a technical university is determined by the knowledge and skills that a future specialist should acquire in the learning process.

The main difference of the language training program in technical universities is the mastery of general scientific and special technical vocabulary. That is why in a technical university, reading and translation training is conducted on the basis of technical texts containing a large number of special terms. But, unfortunately, despite the importance of mastering a foreign language, modern realities are such that the number of study hours that are allocated for this is limited, and groups are overcrowded. In this regard, it is difficult to pay equal attention to all types of speech activity – reading, speaking, writing, listening. In addition, teaching foreign languages in technical universities is complicated by the fact that students have different levels of training. Not all applicants, yesterday's schoolchildren, have sufficient knowledge in the field of linguistics. Having chosen a technical specialty for themselves, many did not pay due attention to language training at school. All the above circumstances negatively affect the effectiveness of the learning process. Despite the fact that the purpose of teaching a foreign language at a technical university is to master all types of speech activity, it is not possible to achieve this, due to objective reasons, in practice. Therefore, it is advisable when building a curriculum, taking into account the above difficulties, to focus not on all types of speech activity, but to choose a priority direction [5].

Summing up, it can be concluded that knowledge of the English language allows to acquire important skills of autonomous learning and get an idea of the strategy of technical education throughout life, which contributes to the professional and personal growth of a person and a technical specialist in general.

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CHARACTERISTIC OF THE TERRITORIES OF ACCUMULATED MERCURY POLLUTION IN THE COUNTRIES OF THE COMMONWEALTH OF INDEPENDENT STATES

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Abstract. The review of accumulated data on mercury pollution of environmental objects of the countries Commonwealth of Independent States (CIS) to the identification of risk factors for the spread of mercury pollution. According to the results of the analysis of scientific literature, it found that the main source of mercury pollution of soil, water from surface sources and atmospheric air of settlements are man-made production facilities.

Keywords: mercury, territories of accumulated mercury pollution, maximum permissible concentration, soil, water sources, atmospheric air.

ХАРАКТЕРИСТИКА ТЕРРИТОРИЙ НАКОПЛЕННОГО РТУТНОГО ЗАГРЯЗНЕНИЯ В СТРАНАХ СОДРУЖЕСТВА НЕЗАВИСИМЫХ ГОСУДАРСТВ

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Аннотация. Проведен анализ данных по ртутному накопленному загрязнению объектов окружающей среды стран Содружества Независимых Государств (СНГ) с выявлением факторов риска распространения загрязнения окружающей среды ртутью. По результатам данных научной литературы установлено, что основным источником загрязнения ртутью почвы, воды поверхностных водоисточников и атмосферного воздуха населенных мест являются техногенные производственные площадки.

Ключевые слова: ртуть, территории накопленного ртутного загрязнения, предельно допустимая концентрация, почва, вода водоисточников, атмосферный воздух.

Introduction. Mercury is a naturally occurring element in the earth's crust that is released into the environment by natural processes. Since the start of the industrial revolution, anthropogenic sources such as the burning of fossil fuels and industrial processes have become significant contributors of mercury to the environment. For this reason, mercury is now widely distributed and persistent in the environment and is considered a major environmental pollutant [1, p. 85; 2, p. 289].

The necessity and relevance of studies on the assessment of environmental pollution by mercury are reflected in the Minamata Convention, ratified by the Russian Federation on September 24, 2014. According to the Convention, the Governments of the countries that are Parties to it must take measures to prevent the development of adverse consequences for public health [2, p. 290; 3, p.1190].

There are more than 3,000 mercury-contaminated sites in the world, which lead to the release of approximately 82 tons of mercury into the atmosphere [3, p.1190; 4, p. 461].

The work aims to conduct a retrospective assessment of mercury accumulated pollution of environmental objects of the CIS countries to characterize territories with the identification of risk factors for the spread of mercury pollution.

Materials and methods**.** This study was retrospective. The analysis of data on concentrations of mercury in environmental objects of the territories of the Russian Federation, Kyrgyzstan and Kazakhstan. On the territory Russian Federation in the city of Usolye-Sibirskoye, Irkutsk region and the village of Semenovsky, the Republic of Bashkortostan, as the residential zone and as the industrial site was evaluated. Statistical analysis of the data in the content for the studied element in environmental objects was carried out using the program Microsoft Excel.

The main criterion for assessing the mercury content in environmental objects (as a factor of adverse effects on public health) was the maximum permissible concentration. The maximum permissible concentration (MPC) of mercury for soil is 2.1 mg/kg, for atmospheric air – 0.0003 mg/m^3, and for water from surface water sources – 0.0001 mg/m^3.

Results and discussion**.** As a rule, natural mercury anomalies have a low level of metal migration into environmental objects, inferior to man-made sources, and do not lead to environmentally hazardous consequences significantly. The studied territories of accumulated mercury pollution usually have a man-made source of mercury pollution [2, p. 289; 5, p.128]. For example, in the cities of Volgograd, Sayansk, Usolye-Sibirskoye, Sterlitamak and Kirovo-Chepetsk, the source of mercury pollution of the territory is chlor-alkali production by mercury electrolysis at chemical enterprises [1, p. 35].

Enterprises in Sayansk and Usolye-Sibirskoye, Irkutsk region had to operate for more than 20 years, table 1.

Table 1 − The period of operation of chlor-alkali production by electrolysis of mercury at chemical enterprises in the Russian Federation

Company name	*Location area*	*Product*	*Year of launch*	*Year of the stop*
Caustic	Volgograd	Production of chlorine and caustic soda by the method of electrolysis with a mercury cathode	1968	current
Sayanskkhimplast	Sayansk		1979	2006
Usolehimprpom	Usolye-Sibirskoye		1970	1998
Caustic Krebs Production	Sterlitamak		1985	1988
Kirovo-Chepetsky chemical plant	Kirovo-Chepetsk		1955	current

In the Republic of Bashkortostan, the main sources of mercury entering the environment are the consequences of the activities of old gold recovery plants and to processing of ores of pyrite deposits. In particular, in the village of Semenovsky there is a Semenovskaya gold recovery factory and in Uchaly Mining and Metallurgical Combine (UMMC) [6, p. 90, 92], figure 1.



Figure 1. UMMC Quarry

In the city of Temirtau in Kazakhstan, the use of mercury catalysts in the production of calcium carbide at the enterprise led to industrial contamination of the soil cover, as well as pollution of the water of the Nura River by sewage [1, p. 35].

Currently, Kyrgyzstan is one of the world's leading countries which has antimony-mercury provinces. This is a significant potential opportunity to increase the production of these metals in the territory, that's why there are environmental, hygienic,

technological and social problems in ensuring minimizing the risk of mercury contamination in the territory of the developed deposits [4, p. 461].

Analysis of information on the assessment of mercury content in environmental objects in the studied territories showed that there was an excess of the maximum permissible concentrations in soil, the water of surface areas and atmospheric air in populated areas in most territories at different periods.

Scientific studies by V. I. Eberil, L. N. Belan and others have shown that the mercury content in the soil in the city of Usolye-Sibirskoye of the Irkutsk region, the village of Semenovsky and the city of Uchaly of the Republic of Bashkortostan is within the MPC. At the same time, on the territories of industrial sites in the city of Usolye-Sibirskoye of the Irkutsk region and the village of Semenovsky of the Republic of Bashkortostan, there is a constant excess of mercury content in the soil, water sources and atmospheric air above the MPC [1, p. 37; 5, p. 129; 6, p. 92].

Conclusions. Thus, in the territories of accumulated mercury pollution of various countries, there is an epicentre of environmental pollution with mercury of man-made nature. This is either territory of a pyrite deposit or the territory chemical product manufacturer previously or has industrial processes using mercury.

The need to improve preventive measures, including systematic monitoring of the level of mercury content in the environmental objects of industrial centres, on the territory of which technogenic sources of mercury are located remains relevant today.

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УДК 574

ECOLOGICAL PROBLEMS OF THE ATOMIC ENERGY INDUSTRY

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Abstract. Nuclear power (atomic energy) is a branch of power engineering engaged in the production of electrical and thermal energy through the conversion of nuclear energy. The purpose of this work is to consider the positive and negative sides of nuclear power, environmental problems caused by nuclear production and ways to solve them.

Keywords: nuclear power, thermal pollution, radioactive waste, ecology.

ЭКОЛОГИЧЕСКИЕ ПРОБЛЕМЫ АТОМНОЙ ЭНЕРГЕТИКИ

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Аннотация. Ядерная энергетика (атомная энергетика) – отрасль энергетики, занимающаяся производством электрической и тепловой энергии путем преобразования ядерной энергии. Целью данной работы является рассмотрение положительных и отрицательных сторон атомной энергетики, экологических проблем, вызванных ядерным производством, и путей их решения.

Ключевые слова: атомная энергетика, тепловое загрязнение, радиоактивные отходы, экология.

The world economy is unthinkable without nuclear power. Nuclear power plants make one tenth of all electricity produced on the planet. Today, there are 192 nuclear power plants operating in 31 countries around the world. As a rule, all of them have several power units – technological complexes of equipment for production of electricity, having a nuclear reactor in their design. The total number of such power units in the world is 451.

The United States with 62 nuclear power plants is in first place, in second place there is France with 19 plants, in third place Japan – 17. Russia ranks the fifth place in the number of nuclear power plants. We have 10 of them with 37 power units. The total capacity of all NPPs in the world is about 392 GW.

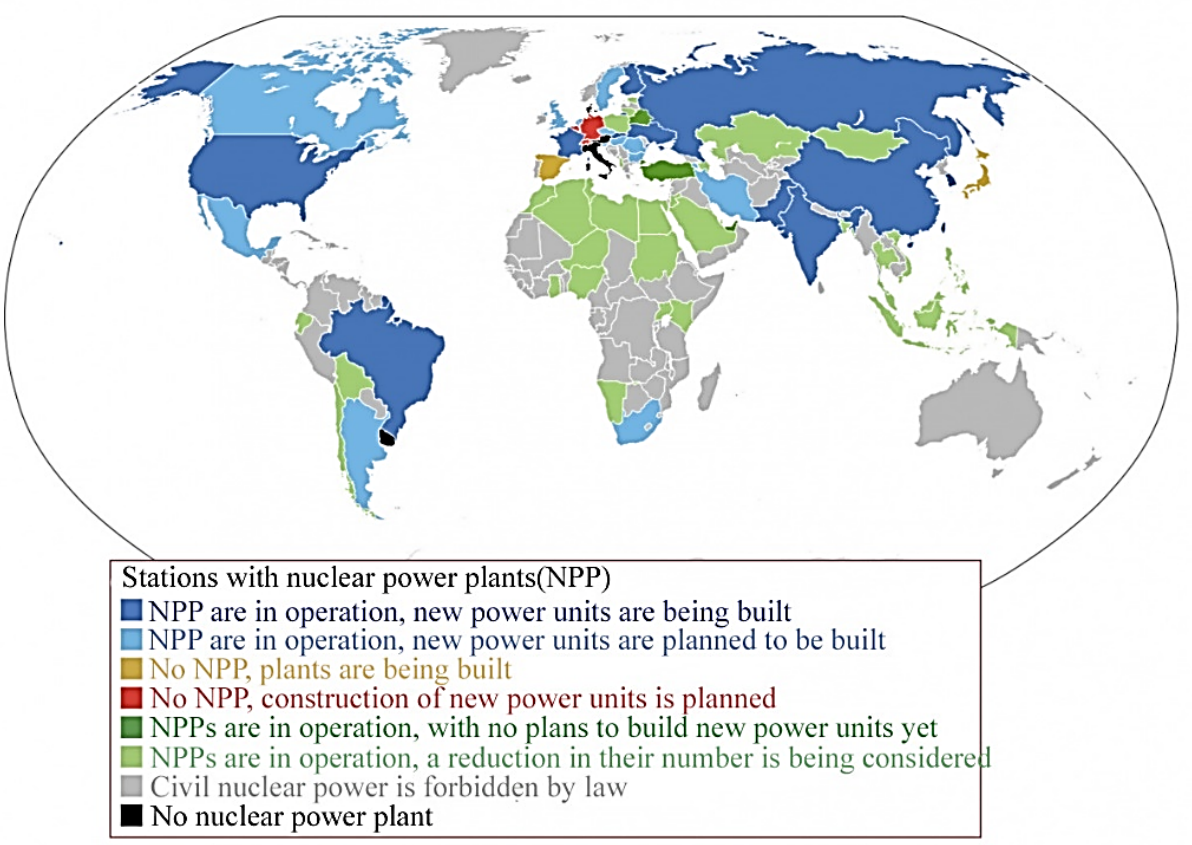


Figure 1. Stations with nuclear power plants

Principle of operation of a nuclear power plant.

The use of atomic energy began almost simultaneously with the development of nuclear weapons. While military developments were underway, studies began on the possibility of using atomic energy for peaceful purposes, primarily for electricity generation. The beginning of peaceful use of nuclear energy is considered to be 1954, when the world's first nuclear power plant started operating in Obninsk, near Moscow.

There are three reciprocal transformations of energy forms at a nuclear power plant:

1. Nuclear energy is converted into thermal energy. Inside the reactor, there is a chain reaction of uranium fission, the process is accompanied by the release of heat. Of course, it does not disappear, there is a special coolant in the reactor, which heats up and transfers this heat to the steam generator.

2. Heat energy is converted into mechanical energy. In the steam generator, the coolant heats water, which turns into steam.

3. The mechanical energy is converted into electrical energy. The steam rotates a turbine, and the result is electricity.

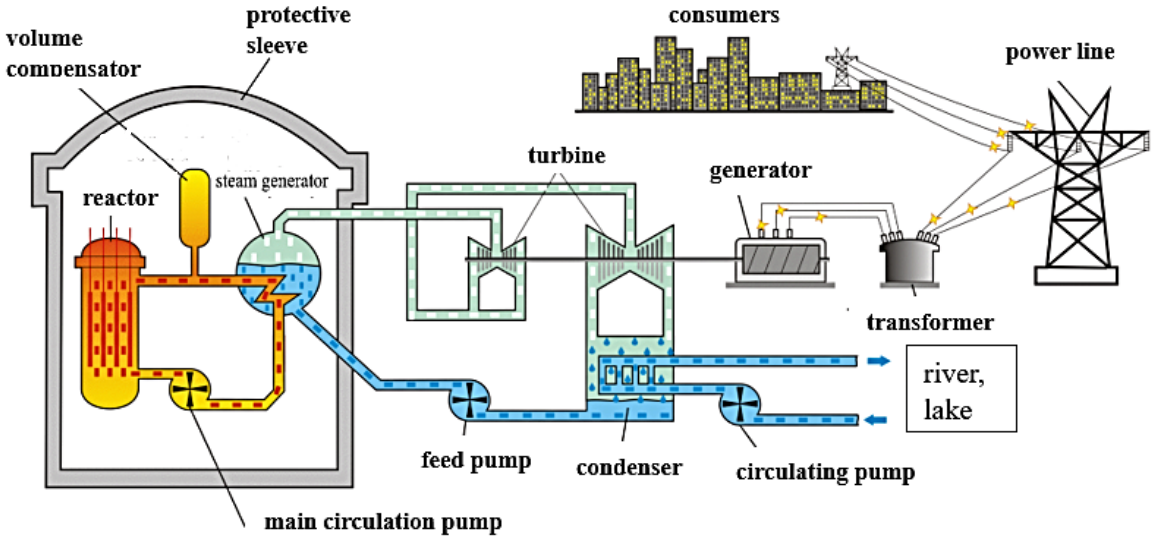


Figure 2. Principle of operation of a nuclear power plant [1]

Consider the pros and cons of nuclear power.

The positive aspects of nuclear power are its enormous energy intensity, the possibility of reuse, the reduction of the greenhouse effect, economic development, and the lowest rates of injury [2].

However, not everything is as good as it sounds, and in addition to the pluses, nuclear power also has certain disadvantages, certain problems.

1. Nuclear accidents – as an example, the accident at the Chernobyl nuclear power plant and the accident at the radio cell institute in Fleurus, Belgium;

2. Generation of radionuclides (an atom that has excess nuclear energy, making it unstable) – radiation leads to suppression of biochemical processes, inhibition of cell division and cell death. The danger of radiation is that the structure of DNA is damaged, the genetic code is destroyed, which causes severe genetic diseases;

3. Accumulation of radioactive fission products of nuclear fuel, which suggests a radioecological hazard;

4. Radioactive waste – some of the waste is recycled, but a significant portion of the waste goes to landfill;

5. Thermal pollution – atmospheric pollution from the operation of nuclear power plants consists in the evaporation of water coming from cooling towers and cooling ponds. And the water bodies themselves, as an object of the hydrosphere, are subject to thermal pollution due to the heating of water. In addition to the atmosphere and hydrosphere, soils can be subject to thermal pollution. Heating of the ground usually occurs in places where pipes are laid: heat, water pipes, collector pipes, industrial pipes. Because of this, the temperature of the ground rises, leading to melting snow or excessive drying of the ground;

6. Destruction of ecosystems and their elements in the places of ore extraction – Ore extraction by open-cut method with creation of canyons by bulldozers and underground mining method, creation of mines and lifting of ores by elevators;

7. Taking considerable volumes of water from various sources and discharging heated water – if these waters get into rivers and other sources, there is a loss of oxygen in them, the probability of blooming increases, the phenomena of thermal stress in hydrobionts increase; radioactive pollution of the atmosphere, water and soil in the process of mining and transportation of raw materials, as well as during the work of nuclear power plants, storage and processing of waste, its burial is not excluded [3].

Now let's look at possible solutions to the problems presented.

1. Continuous modernization and improvement of the quality of equipment used in the operation of nuclear power plants [4];

2. Impose high requirements on the NPP (nuclear power plants) maintenance personnel, constant improve the qualification level of specialists.

3. Proper organization and continuous monitoring of the protection of the environment from harmful emissions.

4. Search for new ways to process nuclear waste. Nuclear waste has different degrees of activity, in connection with which it is divided into:

− low-active;

− moderately active;

− highly active.

When choosing how to dispose the nuclear waste, their activity level is taken into account. Low level radioactive waste poses the least danger, so it is easier to dispose of it. Such materials can be stored in special containers and destroyed after several decades, just like any other waste.

It takes more time and effort to secure moderately active radioactive waste. The trash is recycled and covered with layers of concrete or bitumen.

The burial of recycled material is organized in seismically safe areas. Earthquakes can destroy repositories and provoke an environmental disaster.

High-level radioactive waste poses the greatest threat to future generations. It is impossible to destroy this type of waste; it retains increased activity for thousands of years. The only way to make such materials less hazardous is to reuse them, squeeze out the maximum benefits, thereby reducing the volume of radioactive waste, and vitrify the useless residue.

1. Use of block sorbents for the extraction of radionuclides from aqueous media

2. To ensure the radiation safety of nuclear power facilities, it is necessary to ensure that "safety barriers" (a system that prevents the spread of radiation) that prevent radionuclides from escaping into the environment are sealed and reliably controlled to be able to respond quickly to any potentially dangerous changes in the radiation situation [5].

In conclusion, I would like to say that the construction, maintenance, and especially the operation of a nuclear power plant has an extremely negative impact on the environment under all circumstances, that is why scientists are currently trying to find ways to solve the global problem.

The main direction of nuclear power development should be to close the nuclear fuel cycle and, as a consequence, ensure a more complete use of natural nuclear fuel and artificially fissile materials generated during the operation of nuclear reactors; minimizing the formation of radioactive waste from nuclear fuel processing and

approaching the radiation equivalence of disposed waste and recovered natural fuel; reliable isolation of radionuclides from the environment within protective barriers when disposing of radioactive waste [6].

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УДК 336.648

VENTURE INVESTMENTS IN INNOVATIVE ENTERPRISES IN THE RUSSIAN FEDERATION: HISTORY AND PROSPECTS

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Abstract. This study examines the history of venture capital in the Russian Federation and its prospects. In addition, the importance of venture investments in the conditions of the economic crisis is revealed.

Keywords: finance, venture capital, venture investments, economics, innovative entrepreneurship.

ВЕНЧУРНЫЕ ИНВЕСТИЦИИ В ИННОВАЦИОННЫЕ ПРЕДПРИЯТИЯ В РОССИЙСКОЙ ФЕДЕРАЦИИ: ИСТОРИЯ И ПЕРСПЕКТИВЫ

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Аннотация. В данном исследовании рассматривается история венчурного капитала в Российской Федерации и его перспективы. Кроме того, раскрывается значимость венчурных инвестиций в условиях экономического кризиса.

Ключевые слова: финансы, венчурный капитал, венчурные инвестиции, экономика, инновационное предпринимательство.

As a result of the development of various countries, as well as globalization, the boundaries between various financial institutions are being erased. Due to the formation of the global market over the past 70 years, the economies of various countries are becoming increasingly interconnected. The integration of the financial and manufacturing sectors of various countries entails the emergence of an increasing number of innovative products, the development of the IT (Information Technology) industry, the emergence of fundamentally new types of treatment. All this entails increased competition among market participants for capital raising.

Innovations are an integral part of the economic development of the country, they represent a "locomotive" that allows not only to increase the economic benefits of the company, but also to improve many areas of people's lives, improve the quality of life. However, raising funds in companies that enter a new, previously little-studied market is often difficult. To support innovation, financial resources are needed, as well as specialized financial institutions capable of providing all the necessary information and infrastructure.

The initial formation of the venture market in the Russian Federation is associated with the emergence of market relations. In the second half of the 1990s, Western countries began to show interest in a new, very large and extremely promising market. In 1993-1996, thanks to the participation of European and American partners, the formation of regional venture capital funds began. However, almost all were focused on investments in companies at mature stages (expansion, restructuring, late). After the 1998 crisis, only 3 of the 11 largest funds remained: Norum, Eagle, Quadriga Capital [1].

The active development of the Russian venture capital investment market took place in the period from 2006 to 2013 (Figure 1) [2].

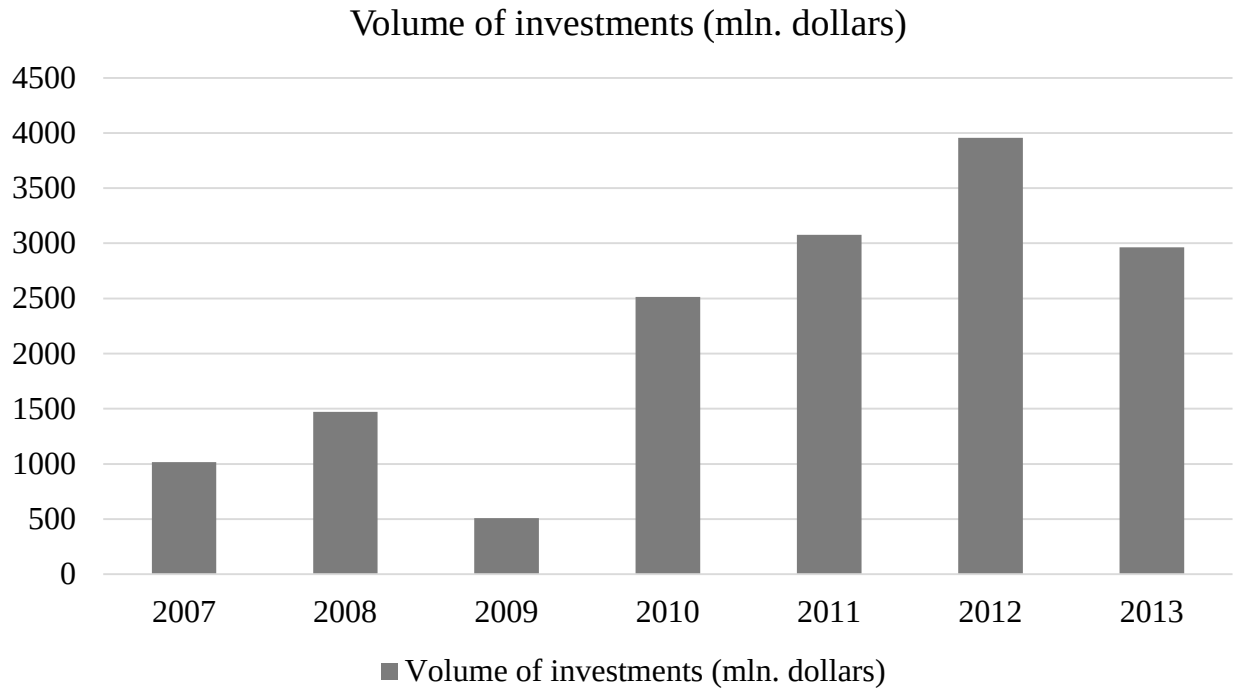


Figure 1. The volume of investments in the Russian venture capital market

Venture funds in the Russian Federation perform many functions, the main ones are [3]:

- accumulation of investors' funds;
- selection and analysis of venture innovation projects for risks, economic and marketing expediency of investments;

– financing of promising projects and support of the project at all stages of implementation;
– indirect (occasionally direct) participation in the management of an innovative enterprise.

Many factors influence the investment of venture capital in innovative enterprises. However, the Russian market is characterized by several fundamental risks: the geopolitical situation and the high dependence of the economic environment on oil prices. We can observe this trend in the context of 2014-2015, when the decline in economic activity was associated (Figure 2) with the introduction of sanctions, on the example of 2020, when the average price for "URALS" crude oil was $41.73, as well as according to the results of the 1st half of 2022: according to the investment company "A.Partners" [4], during the period from January to August, investment funds concluded 31 deals with IT startups, during the same period of 2021, 121 agreements were concluded. Thus, it can be concluded that the volume of PE (Private Equity)- and VC (Venture Capital)- investments will decrease several times this year.

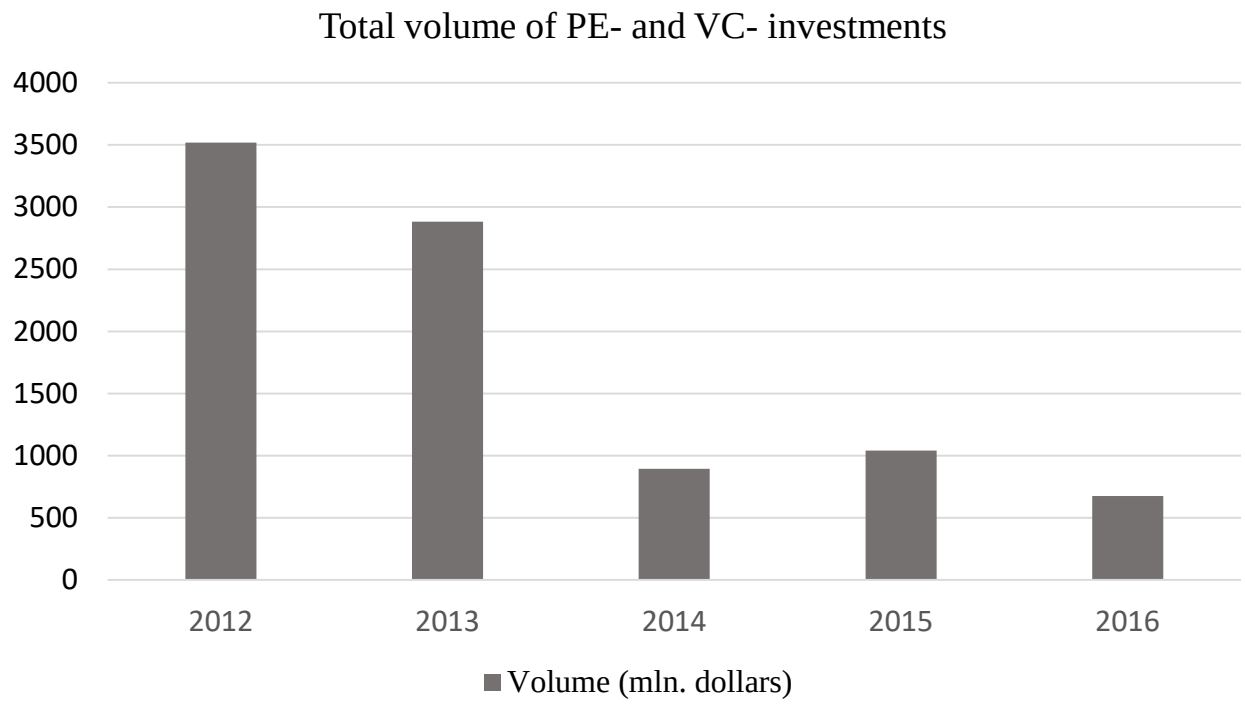


Figure 2. Dynamics of venture capital investments during the economic crisis

There are also a number of other factors that negatively affect venture capital investment in the Russian Federation. First of all, there is a lack of desire among venture investors to develop small and medium–sized businesses. However, this is not due to a lack of capital, but to the lack of revolutionary ideas and products on the Russian market. Another equally important factor is the weak regulatory framework, which is not fully capable of ensuring the functioning and development of both the entire venture investment system and SMEs (small and medium-sized enterprises). This factor also implies the following: poor infrastructure development, which does

not allow for effective and purposeful cooperation between venture financing entities and small innovative enterprises, prevents the emergence of new and further development of existing small innovative enterprises.

According to the Analytical Centre under the Government of the Russian Federation, the main factors constraining innovation activity in Russia are:

- financial problems: lack of own financial resources (41 %), as well as lack of investments (12 %), limited centralized sources of financing, borrowed and borrowed funds, unacceptable credit conditions (16 %);
- insufficient implementation of specific innovative projects due to low demand for scientific and technical products (such demand in Russia may still be mainly from the state) [5].

Having considered and analyzed the current state and development of venture financing, we can identify several areas of state support for venture entrepreneurship in Russia:

- improvement of the regulatory and legal regulation of innovative, scientific, technical and venture directions;
- thorough solution of legal problems arising from the use and creation of intellectual property, the formation of a system of benefits and approaches to motivation of work;
- creation of organizational and managerial conditions for venture financing based on the formation of a state property management system.

For Russian innovative enterprises, VC is one of the most promising sources of financing that can support the company at the initial stages. In this case, innovative enterprises will be able to focus on the refinement and improvement of their product. Also, venture investments allow not only to attract capital, but also are a kind of indicator of the most high-quality projects.

The venture capital investment sector continues to experience difficulties caused by the deep financial crisis. However, despite the difficult conditions, there is hope that in the future the Russian venture capital investment market will demonstrate good performance.

The role of venture capital has not been fully realized in Russia, which allows for the possibility of its future development with an optimal ratio of the interest of economic agents and the creation of prerequisites necessary for its development.

Venture financing is a necessary system that ensures the development of not only the innovative sector of the economy, but also all its aspects. Therefore, for the effective development of the economy of the Russian Federation, especially in a situation of economic crisis caused by sanctions pressure, it is necessary to solve all the main problems of venture entrepreneurship, as well as active state support aimed at creating favorable conditions and creating infrastructure for the creation and sale of innovative products.

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УДК 681.5

MACHINE LEARNING AS A MODERN TOOL FOR PRODUCTION MANAGEMENT

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Abstract. This article discusses machine learning as a modern tool for production management, describes the methods of possible learning and their differences, and highlights examples of the use of machine learning in modern technological production and entertainment services.

Keywords: automation, process, machine learning, production management, enterprise, deep learning, efficiency, economy.

МАШИННОЕ ОБУЧЕНИЕ КАК СОВРЕМЕННЫЙ ИНСТРУМЕНТ УПРАВЛЕНИЯ ПРОИЗВОДСТВОМ

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Аннотация. В данной статье рассматривается машинное обучение как современный инструмент управления производством, описываются методы возможного обучения и их отличия, а также представлены примеры применения машинного обучения на современных технологических производствах и развлекательных сервисах.

Ключевые слова: автоматизация, технологический процесс, машинное обучение, управление производством, предприятие, глубокое обучение, эффективность, экономичность.

Due to the extensive development of technology, modern companies are increasingly increasing the rate of production of goods and services. It is no longer possible for an employee to cope fully with this rate of production, so machine learning is used to help, which can not only speed up the production process, but also reduce the number of defects in production.

Machine learning is considered part of the science of artificial intelligence and is a methodology for training machines, based on the data obtained in the process, in order to ensure that the machines are able to cope independently with a certain range of tasks [1].

Machine learning includes several methods of learning, such as deep learning, classical "with a teacher" and "without a teacher" learning, "ensembles" and "with reinforcement" learning.

Machine learning "with a teacher" is the introduction of data along with the results to be considered correct by the system. In this case, learning comes down to the machine finding features on its own that allow it to navigate among the data. As a rule, machines with this type of learning are used to solve problems of classification and regression. For example, the selection on photos of certain types of objects.

Machine learning "without a teacher" is a more complicated version. In this case, the machine must learn to isolate the relationships between the received data, determine the patterns, and perform clustering.

As an example of machine learning "without a teacher" we can give the modern entertainment services of the firm "Yandex" on providing individualized advertising, video hosting "YouTube" with the function of providing recommendations based on already watched videos, and the well-known social network "Vkontakte", where the formation of selections with music, according to the percentage of compliance with the listened audio songs is carried out.

Learning "with reinforcement" is a complex learning in which the machine is forced to learn based on its own errors, repeating iterations until the number of errors is minimal. This learning is achieved by fixing incorrect decisions, from which the machine "draws conclusions". The definition of "ensembles" refers to a set of several combined machine-learning algorithms that compensate for each other's errors in the learning process. This method of learning is widely used, for example, in the development of face recognition systems and computer vision systems. Deep learning is part of machine learning, but it uses huge amounts of data called datasets. In this regard, this learning requires an increased amount of resources [2].

As examples of the implementation of deep learning should be given modern systems, which are tightly integrated into the world, namely various chat bots for various support services, businesses and medical organizations, various types of voice assistants ("Siri" and "Alice") and the implementation of various biometric systems for the Interior Ministry, banks and cell phones.

One of the most important properties of machine learning is the ability of a learning system to build mathematical connections between input and output data. The set of neurons that form a neural network does not have data about this relationship, but is able to build it based on the different data sets loaded into the system.

Any machine learning operates with three main parameters: data, features and algorithms [3].

By data, we mean various samples, examples of solutions of necessary problems and other information, which will be useful in training of neural networks. By features, we mean the features of the data, which are peculiar to a certain area. The features can include certain parameters, such as frequency, temperature or the number of paws of

the animal. The fewer parameters are used in training and the better they are specified for the system, the faster is the training and the smaller is the error in the result.

Algorithms refer to possible methods for solving a given problem. As a rule, a given problem can be solved by several different methods, but the system must choose the best solution. Based on the three main parameters of machine learning, the structure will have the form shown in figure 1.

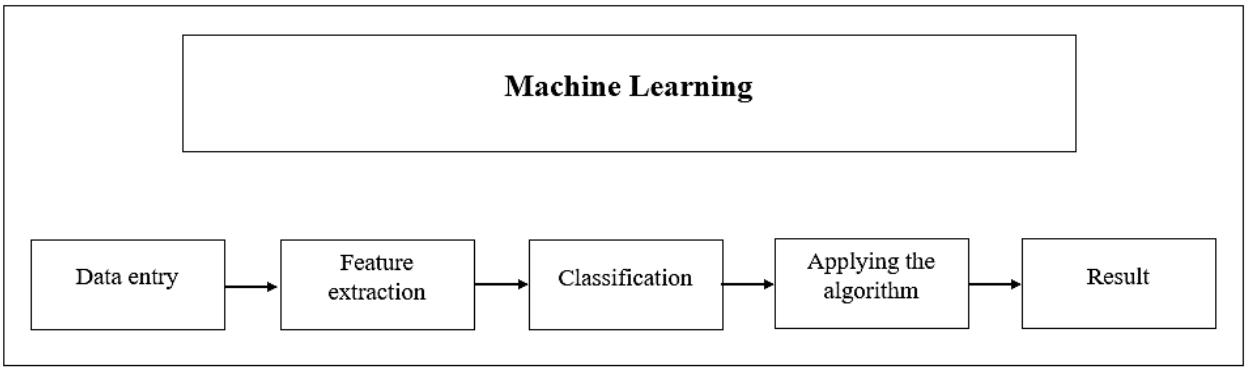


Figure 1. Structure of machine learning

Modern technological processes are an extensive complex combining a large number of various working installations and units, and every year the industries try to increase their technological capacity, which, in turn, increases the requirements for safety, convenience and efficiency of technological process control.

Due to the high rate of development of information and communication technologies and hardware in technological process control systems, the human factor influences on the process itself is reduced, and the human role is reduced to making decisions based on the data received and processed by the system.

Such systems, which reduce the number of parameters for decision-making and help in decision-making, with the help of pre-built algorithms in these systems, are called expert systems.

However, due to the progress of technological processes, a number of problems arise associated with the complexity of emerging non-linear problems that cannot to solved by conventional algorithmic methods, or their solution requires an unacceptable amount of time or material resources.

Machine learning systems are best suited to solve such problems. Machine learning, unlike regression analysis used in expert systems, can be used with complex, unknown or poorly understood dynamic processes, because the result after machine learning is not just a formula, but a whole algorithm for calculating the output value.

Modern industrial production combines the interaction of automated technological processes with business processes, which contain important economic indicators for the enterprise, reflecting the efficiency and economy of the enterprise [4]. Application of machine learning in the enterprise allows not only to increase productivity, but also to reduce the cost of various technological processes by tracking process parameters, diagnostics and selection of optimal modes of operation for equipment, economical supply of raw materials, as well as predicting possible failures and solutions for their elimination.

Machine learning is successfully used by many companies, such as "GE Oil&Gas", where the use of this technology allowed to minimize the number of downtime and accidents during mining, the energy company "Shell", where machine learning is designed to automatically identify security threats and notify employees, various banks, where machines are trained to monitor fraudulent transactions with funds of citizens [5; 6].

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УДК 519.83

DIGITAL AND EDUCATIONAL GAMES

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Abstract. This article discusses the impact of games on children. A review of research has been made, the issue of the interaction of digital games on the development of educational skills and information competencies in students has been studied, and the problem of the harm of video games to the health and mental abilities of children has been touched upon.

Keywords: internet, digital, game, education.

ЦИФРОВЫЕ И ОБУЧАЮЩИЕ ИГРЫ

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Аннотация. В данной статье рассмотрено влияние игр на детей. Произведен обзор исследований, изучен вопрос взаимодействия цифровых игр на развитие образовательных навыков и информационных компетенций у учеников, а также затронута проблема вреда видеоигр на здоровье и умственные способности детей.

Ключевые слова: интернет, цифровые технологии, игра, образование.

Digital games and education is an area of educational research that studies what is learned by playing video games and how game design principles, data and communities can be used to develop new learning environments. The researchers are also exploring how data generated by a digital game can be used to design future learning assessment methods. Video games create new social and cultural worlds, worlds that help people learn by combining thinking, social interaction, and technology, all serving the things that interest them. Computers and other technologies have changed the way students learn. Integrating video games into education allows for the creation of new and powerful teaching methods in schools, communities, and the workplace [1, p. 131]. Research on video games and learning highlights the educational and social benefits of digital games. In particular, it explores how new digital media shift the subject of educational research from remembering and repeating information to the ability to find, evaluate and use it convincingly at the right time and in the right context. In addition, the study concerns the study of how digital games and gaming communities, which can lead to educational skills of the 21st century, such as: high-level thinking, solving complex problems, thinking independently, collaborating,

communicating and using digital tools to efficiently collect information. This suggests that video games do not need to be specifically education-oriented to be an educational tool. Digital games can combine ways of knowing, ways of acting, ways of being and caring.

Properly designed digital gaming capabilities can provide powerful benefits for motivation and learning. Individual studies have shown, for example, that well-designed video games can contribute to conceptual understanding and process skills, contributing to a deeper epistemological understanding of nature and nature. The development of scientific knowledge and the processes that can cause the development of the willingness and ability of players to participate in scientific discourse and practice [2, p. 40]. Digital games teach students that failure is inevitable but irreversible. Failing in school is a big problem. In video games, players can simply start with the last save. Low cost ensures that players take risks, try new things.

Most of the debate about digital games for education is based on whether video games generate learning or not. But this question is too simple. A report by the National Research Council on laboratory activities and modeling explains that not only the means of physical or virtual learning activity design determines its effectiveness. Digital games are environments with certain advantages and limitations, such as physical laboratories and virtual simulations. Modeling and digital games share many similarities in this regard. Although there are several definitions of digital games, the main features that distinguish video games from simulation include:

− Rules for participation in the simulation

− Goals set by the players

− Means showing players the progress of achieving these goals

As the American educator John Dewey said, schools are built on a passion for facts. Through the game, students can learn by doing something as part of a larger community of people who share common goals and ways to achieve common goals, turning the game into an advantage for social reasons. Basically, knowledge related to video games is what you are going through, the result of a work in which continuous discovery, research, bonding, weaving, action and reflection go hand in hand (otherwise the game ends). As everyone can see, all this brings important fruits to the school experience, but also to the pedagogy of everyday life [3, p. 87]. The game also changed the look of curricula in schools based solely on content. In content-based media, people learn when they are told and by thinking about what they are told. In video games, on the other hand, game designers create digital environments and game levels that shape, facilitate, and even teach problem solving.

American researcher and psychologist Peter Gray , who conducted research on Early Childhood Education, says that play is a purely useful activity for young children. It states that children can choose the way to make the most of their time, and that the widespread use of a particular learning tool shows that they get something valuable from it. He goes on to say that the importance of the computer in modern times and that it is simply stupid not to use it as a learning tool. The researchers conducted the same experiment again with 25 volunteers in each group and ended up with the same result. Previous studies have shown that computer games in general can develop as additional interventions, in areas such as schizophrenia, anxiety disorders and attention deficit and hyperactivity disorders. Although very little research has been done on the

impact of video games in psychotherapy, future collaboration between doctors and video game developers may lead to the creation of specific games for use in psychotherapy. It is important to note that not all video games can play a role in psychotherapy, and some can do the opposite. There are currently many games available that can train your brain for better concentration and concentration. Finally, video games can help people with mental disorders such as schizophrenia, anxiety and autism spectrum, as well as improve mood and promote relaxation [4, p. 152].

Games challenge our mental skills in such a way that performance in other tasks involving the same skills improves. In a study conducted in 2013, a double-blind randomized clinical trial was conducted using a mind training game and a quiz. A total of 32 people were registered. Cognitive functions were recorded before and after training. It was concluded that executive roles, working memory and processing speed were improved in commercial mind training games. Gamers demonstrate a wider range of cognitive abilities, in particular related to knowledge, analogy, processing speed, deductive reasoning and mathematical intelligence. In this study, those who play video games on a long-term basis showed improved cognitive abilities compared to those who do not engage in gaming activities, suggesting that gaming activity causes improvements in brain function.

In his book "Whats Video Games Has Teach us about Learning and Literacy", James Paul Guy talks about the principles of digital learning and their application. Ji focused on learning principles in video games, showing the reader the different ways in which games and learning connect, and how each principle supports learning through play. The most successful video games are those that are capable of challenging players, as they motivate them to persevere and teach them to play [5, p. 320]. Video games have shown a positive level of improvement in areas of cognitive function. In their study, improving the ability to multitask through action video games, Chiappe and colleagues found that 50 hours of gameplay significantly improved performance test results based on the skills used when piloting an aircraft. In addition, areas of attention and vigilance, as well as basic visual processes, improve with the time allotted for video games.

− Problem solving: many video games allow you to move to the next level using strategies. The processes of finding the best strategy to use require multiple attempts from the player. In this way, the brain is stimulated to improve more and more problem-solving skills, which are an important skill in everyday life;

− Collaboration and collaboration: according to various studies, video games help young people socialize, developing a tendency to collaborate, thanks to large virtual communities and the fact that more than 70 % of them play in partnership;

− Attention and concentration: video games allow you to improve your concentration and concentration. In this way, attention skills are developed, such as selecting stimuli to focus on or being able to maintain concentration on those elements for a sufficiently long time;

− Faster solutions: especially in action video games where players need to move quickly, remember additional details and information at the same time, and make two-second decisions.

In a pessimistic view of video games, the player's situation can easily be seen in the magical, pervasive, and invasive dimensions of the reading areas. Thanks to its

immersive approach, the video game appears as a mechanism that distracts the youngest from the usual and concentrated activities related to education and training. Therefore, some studies believe that these standards and testing methods are not suitable for teaching methods that include video games. By themselves, they cannot make schools more efficient, they cannot replace teachers or be an educational resource with access to an unlimited number of students.

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TRICKY PACKAGING AND DECEPTION OF BUYERS WHEN USING PACKAGING DESIGN

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Abstract. The article analyzes packaging design as a powerful marketing tool that influences the final choice of the consumer, and considers the major features of successful package design. The major tricks that manufacturers use to mislead customers are discussed and exemplified.

Keywords: design, marketing, packaging, marking, products, environmental friendliness, goods.

ХИТРЫЕ УПАКОВКИ И ОБМАН ПОКУПАТЕЛЯ ПРИ ИСПОЛЬЗОВАНИИ ДИЗАЙН-УПАКОВКИ

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Аннотация. В статье рассматривается оформление упаковки как сильный маркетинговый инструмент, который влияет на конечный выбор потребителя, а также анализируются критерии, по которым дизайн признается удачным. Приводятся примеры основных хитростей в дизайне упаковки, используемых производителями, чтобы ввести покупателя в заблуждение.

Ключевые слова: дизайн, маркетинг, упаковка, маркировка, экологичность, товары.

Over the past few decades, the purchasing power of the population has been increasing worldwide. Accordingly, the number of manufacturers of various products is growing. Nowadays, there are several factors that affect the success of sales. And among these factors, design plays a key role. However, it is not uncommon that creative and original packaging does not reflect the essence of the product. Unscrupulous sellers use various tricks to increase their margins.

To understand this issue, it is necessary to examine the criteria due to which design is recognized as successful [1]. The main criteria for evaluating the effectiveness of packaging design are: the visual attractiveness, the use of logos, informativeness, advertising function, the use of special labels (“eco”, “bio”, “organic”, etc.), visibility of the product compared to other goods.

The visual component determines one of the most important factors: the probability that the goods will be bought. Bright design catches the buyer from a distance. The shopping experience of many people can confirm that sometimes purchases are made impulsively. Just noticing the package, a person decides to buy a product that, most likely, is unnecessary (Figure 1).



Figure 1. Colourful milk bottles

The logo is the hallmark of the brand. It is no secret that the more recognizable the logo, the higher the confidence of buyers in it. It provides for building a lasting associative relationship with the quality of products of a particular manufacturer. Unfortunately, not all manufacturers are ready to create their own trademark. Some simply copy other companies’ logos with minimal differences in order to attract customers. This way, they sell products of inadequate quality to negligent buyers (Figure 2; Figure 3).



Figure 2. Starbucks logo



Figure 3. Starbucks imitation logo

Information is the first thing a buyer looks for when holding a product. Back in 1890, William James, who created the first book on modern psychology, described our attention as focusing on one thing and ignoring the other [2]. The faster the brain gets the information it needs, the faster the decision is made. Also, since the processing speed is about 120 bits per second, the mind gets tired of constant stress in the controls of simple aspects of our life [3]. Thus, knowing how exactly attention is allocated, marketers arrange the data on the product to their best advantage: the brand and the product name, information about composition, shelf life and the need to keep out of reach of children, pictograms, the slogan, the company legend, legal information, etc. must be in the right place. It is also necessary to choose the font and its size and make the text blocks easy to perceive.

Advertising function is a distinctive feature of the product, affecting its popularity. Packaging is often covered with information about raffles and discounts, as well as motivational messages designed to increase brand confidence and sales. With such a wrapper, the entire trading shelf with the presented goods turns into advertising space.

Another popular example is the use of false labels “bio” and “eco” (Figure 4). Unfortunately, these labels do not indicate that the product or the packaging are environmentally friendly. The term “environmentally friendly products” basically refers to the products created from recyclable materials, packaging that can be used for the second time in other fields of activity, goods, whose production causes minimal damage to the environment. Nevertheless, “bio” and “eco” labels are more related to the way the products are produced than to the packaging, which is most often made of plastic.



Figure 4. Product “naturalness” markers

In addition, the labels themselves do not reflect the true essence of the product. Farm products, for example, should only be produced on a farm, but this is not a guarantee of their “environmental friendliness”. The term “organic products” would be more correct in this case. Anyway, the packages with these labels are more likely to attract potential customers.

Furthermore, unscrupulous sellers understand that each buyer tends to give less money for more weight of the goods. Consequently, often the packaging design can create the illusion of a large volume. This does not violate the Law on the Protection of the Consumers’ Rights [4] in any way, but negatively affects the reputation of the manufacturer. Often such deception appears in the form of collections on thematic forums (Figure 5).



Figure 5. Packaging with the illusion of large volume

Another trick in designing packaging is the use of gender stereotypes. Certain initially gender-neutral products whose functionality has nothing to do with the sex of the user are produced with packaging design for women and men. It can be anything: shampoo, razors, socks, cigarettes, etc. For women the packaging is most often made pink, with flowers and rhinestones. Products for men are blue, gray, black, with concise design. What is more, according to studies, “pink” goods can cost 8 % more than other products [3] (Figure 5).

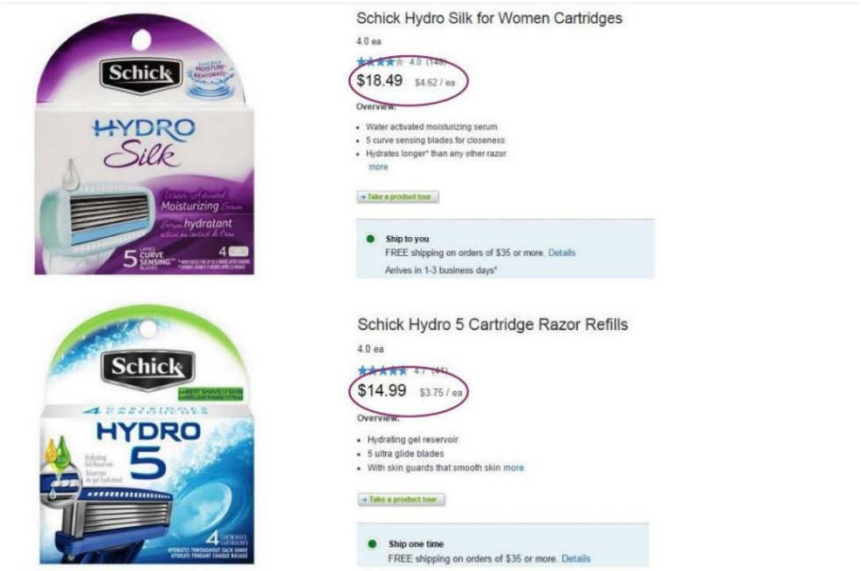


Figure 6. Razor Cartridges for men and women

Despite the fact that the research was conducted in the USA, New York, the Russian community also recognizes this problem. In 2017, the president of the Chamber of Commerce and Industry of Russia Sergey Katyrin, in an interview with Izvestia, said that the pink tax is a global trend. The pink tax exists mainly due to two factors: the sexism of manufacturers, marketers and gender stereotypes of shoppers. Despite global trends, some companies are still trying to cash in on girls [5].

Thus, packaging design is undoubtedly one of the most important steps in the development of products, it is a powerful marketing tool that influences the final consumer choice and is as important as the brand individualization strategy. Only by meeting all requirements for packaging design can a company create a project that will attract the attention of the target audience. However, packaging design still contributes to misleading buyers in the areas that are not provided for by Law, the examples being visual deception, fine print, the use of gender stereotypes, and many other tricks.

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FEATURES OF ENSURING THE ECONOMIC SECURITY OF RAILWAY TRANSPORT ENTERPRISES

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Abstract. The specifics of the railway industry, modern ideas about safety, which must be taken into account for the training of specialists in the economic field of activity, are considered. Special factors that have a direct impact on economic systems are highlighted, the key features of modern threats to the economic security of JSC "Russian Railways" are also considered. Based on the analysis, an idea of the role of transport in economic security is formulated.

Keywords: transport security, economic activity, railway industry, economic indicators, railway safety.

ОСОБЕННОСТИ ОБЕСПЕЧЕНИЯ ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ ПРЕДПРИЯТИЙ ЖЕЛЕЗНОДОРОЖНОГО ТРАНСПОРТА

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Аннотация. В статье рассматривается специфика железнодорожной отрасли, современные представления о безопасности, которые необходимо учитывать при подготовке специалистов в экономической сфере деятельности. Выделены особые факторы, оказывающие непосредственное влияние на экономические системы, также рассмотрены ключевые особенности современных угроз экономической безопасности ОАО "Российские железные дороги". На основе проведенного анализа сформулировано представление о роли транспорта в обеспечении экономической безопасности.

Ключевые слова: транспортная безопасность, экономическая деятельность, железнодорожная отрасль, экономические показатели, безопасность железных дорог.

Railway transport is a large-scale transport system, the primary task of which is to ensure the safety of train traffic, high-quality passenger service, and meeting the needs of the population in terms of transportation [1]. The role of railway transport due to the vast territories of the country, natural resources, demand for movement, is high.

Thanks to the competent functioning of the railway industry, the development of all industries is possible.

The purpose of the work is to determine the economic safety of railway transport as a science, as well as to identify the specifics of the representation of the safety of the railway network.

The peculiarity of railway transport as a sphere of economy is the delivery of special equipment and materials necessary for the production, which ultimately represent finished products. With the help of such a large network in the world as rail transport, it is possible to create and implement the latest options for the development of interval train control systems that are responsible for traffic safety, as well as determining the capacity of a railway section [2; 3]. The advantages of rail transport include:

− high throughput rates;

− implementation of regular transportation at any time of the year and under various weather conditions;

− servicing all sectors of the economy;

− meeting the needs of the population in transportation;

− low level of environmental impact;

− provision of a centralized railway transportation management system;

− a feature in the geographical unity of the country, etc. [4].

Given that the railway industry is one of the main ones in ensuring economic security, it is important to take into account all the factors that have a positive effect on the integrity of the vast territories of the country. All the elements that make up the economic sphere of activity make up a single scheme for representing economic security (Figure 1). Due to this, threats on railway sections are eliminated in a short time, reliable functioning of train traffic control systems [5].

However, the elements presented (Figure 1) and their direct relationship can lead to negative consequences due to emerging threats to economic structures: unstable functioning due to the limited availability of certain types of resources, the absence of a large number of intelligent control systems for the organization of railway management.

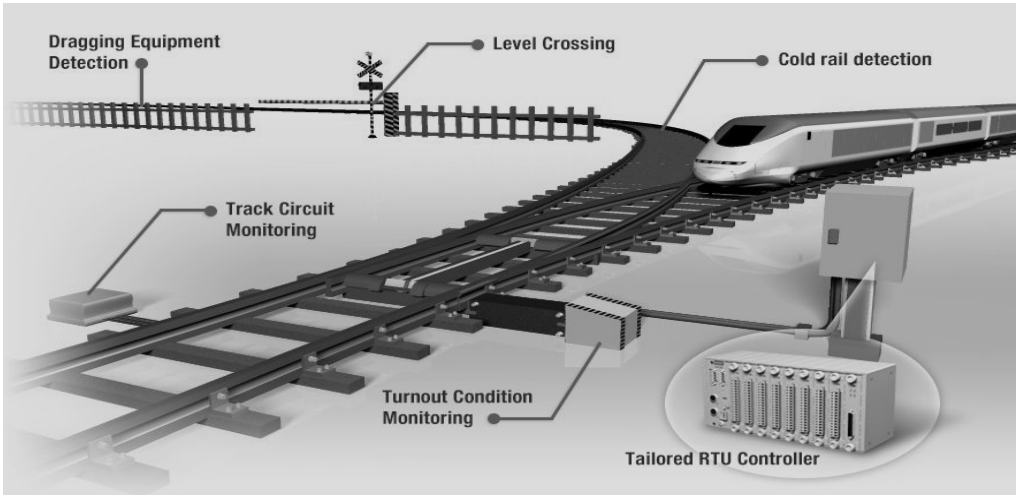


Figure 1. Components of economic security in railway transport

In order to combat the emerging threat to economic security in railway transport, it is necessary to introduce a qualitative diagnostic model that would identify differences in economic security indicators and prevent material and financial damage. For this purpose, it is important to study the research topic in depth: assessment of financial, personnel, technical and technological components of economic security of railway transport, identification of characteristics of its levels.

Usually, the economic security of transport is assessed using indicators that most clearly reflect the important aspects of ensuring the country and providing services to the population and economy at a high level, that is, the level of implementation:

1. Passenger transportation.
2. Cargo transportation.
3. Repair and maintenance work.
4. Maintenance and repair of transport.
5. Training of production personnel.

In confirmation of the multifunctionality of Russian railways in terms of ensuring economic stability and safety, there are some factors. The results of the activities of companies in the real sector of the economy are of great importance for the economic development of the country. Joint Stock Company "Russian Railways" (JSC "Russian Railways") occupies a special place in the Russian economy, since it accounts for 45 % of the total cargo turnover and more than 25 % of passenger traffic in the country. Given such a significant socio-economic role of railways in Russia, the importance of financial and economic stability and efficiency of their activities goes beyond the transport industry, acquiring a macroeconomic character. Thus, according to the Comprehensive Plan of Modernization and Expansion of the Trunk Infrastructure approved by the Government for the period up to 2024, the implementation of a number of significant projects for the country's economy is directly related to the financial capabilities of Russian Railways.

Activities on corporate and economic security of JSC "FPC" in 2019 were carried out in the following areas:

− prevention and suppression of possible damage as a result of intentional or accidental unauthorized interference in the process of activity of JSC "FPC";

− prevention of losses, including theft of financial and logistical resources, destruction of property and valuables;

− implementation of measures to prevent threats of loss (destruction) of property;

− compensation for material damage caused as a result of illegal (illegal) actions of individual legal entities and individuals;

− timely identification, prevention and localization of internal and external threats to the economic interests of JSC "FPC", as well as the organization and implementation of measures to minimize (compensate) the damage caused;

− organization of interaction with law enforcement agencies in order to prevent and suppress offenses directed against the interests of JSC "FPC".

There are a number of methods that allow us to assess the degree of balance of various parameters of activity: a system of balanced indicators, models of the quality of economic growth, models of embedded options, models of value chains, etc.,

however, their application for analysis of the activities of railway transport enterprises may not always be considered justified due to the specifics of the activity and the market position of this industry. This is due to a number of factors:

− JSC "Russian Railways" cannot be considered a corporation in the broad sense of the word

due to the structure of its own capital;

− JSC "Russian Railways" cannot be bankrupt under the existing paradigm of industry management;

− the owner of the organization does not pursue as the main goal the receipt of dividends;

− the process of creating added value is limited by regulations, in addition, the structural reform of the transport industry in some cases led to

to reduce the potential for value creation in favor of the potential for the artificial development of competition;

− the value created is not distributed according to the principles of functioning of financial markets;

− the product being created (the service being rendered) is complex, as a result of which it is not always possible to decompose the added value into the result

of the operation of a particular factor of production;

− accordingly, factor analysis of return on capital does not provide relevant informative results in the analysis;

− there is a big difference in the indicators of financial statements according to international and Russian standards (differences in the reflection of assets, capital and financial performance).

As a measure to ensure the economic security of JSC "Russian Railways", it is proposed to develop an economic security strategy, formulating goals and specifying the objects of the strategy, should include a description of external and internal threats to the economic security of the enterprise; identification and monitoring of factors that strengthen or destroy the stability of its socio-economic situation in the short and medium term; determination of criteria and parameters of indicators characterizing the interests of the enterprise and meeting the requirements of its economic security, development of economic policy, including accounting mechanisms affecting the state of economic security factors; directions of the enterprise's activities to implement the strategy. As initial data for the calculation of the proposed criteria system, accounting and reporting data of JSC "Russian Railways" from the moment of its creation in 2003 to the present time, data from the company's corporate social report, target indicators of the development strategy of JSC "Russian Railways", as well as statistical accounting data were used.

The degree of adequacy of the assessment of the economic security of the enterprise of the existing reality in production and the set of necessary measures to prevent and parry the danger corresponding to the scale and nature of the threats depends on the accurate identification of threats, on the correct choice of the meters of their manifestation, i. e. the system of indicators for monitoring (they are also called an indicator).

The management of the enterprise needs to define the following requirements for ensuring economic security at the enterprise as the main tasks of the security service:

1. Ensuring the protection of the property property of the enterprise

2. Development of an enterprise security system, optimal placement of posts, security equipment, fire-fighting automation, alarm systems and communications

3. Allocation of premises for storage of inventory and cash

4. Identification of technological equipment, the failure of which can lead to large economic losses, development of measures to neutralize threats

5. Identification of vulnerabilities in the technology of the production cycle, unauthorized cycle, unauthorized changes in which may lead to loss of quality of products and cause material damage, taking appropriate measures

6. Maintenance of the access regime in the protected area (order, time of admission of workers, visitors to the territory, the order of export (import) or removal (import) of material values, finished products. Materials

7. Conducting official investigations on the facts of violation of the procedure for working with property values

8. Organization of interaction with security agencies and internal affairs bodies on the economic security of the enterprise.

Reliable provision of economic security at all levels of the economic system is possible under the condition of stable functioning of the transport industry, since its potential is a determining stabilizing factor of anti-crisis development, a guarantor of economic growth and maintenance of economic independence and security of the country.

Modern economic conditions and the scientific and technical level of development of transport systems are in the process of radical restructuring of organizational and legal forms of socio-economic relations and systems of production and management organization. In particular, during the reform of the transport industry, a lot of work has been done in the field of economic separation of business types and the construction of the Russian Railways holding company.

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PROBLEMS AND PROSPECTS OF VISION REPLACEMENT TECHNOLOGIES

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Abstract. This paper discusses ways to replace human innate vision with modern analogues for visually impaired and blind people, working with the help of algorithms for retraining human neurons.

Keywords: vision, neuron, technology, blindness.

ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ ТЕХНОЛОГИЙ ЗАМЕЩЕНИЯ ЗРЕНИЯ

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Аннотация. В данной работе рассмотрены способы замены зрения на современные аналоги для слабовидящих и незрячих людей, работающих с помощью алгоритмов, путем переобучения человеческих нейронов.

Ключевые слова: зрение, нейрон, технология, слепота.

Nowadays, the technological sphere associated with partial recovery of vision by using various algorithms that can be used to stimulate areas of the brain's cortex for partial replacement of vision is in high demand. Such technologies are based on the property of neuroplasticity of the brain, which allows some areas of the brain to change under the influence of experience, as well as to recover lost connections after damage or create new connections, which allows you to replace one way of perception with another.

Thus, according to the World Health Organization (WHO) at the end of 2018, there are about 1.3 billion people in the world with some form of visual impairment.

human. From 36 to 39 million of them are totally blind, among which 1.4 million are irreversibly blind children [1]. Most of the people with similar problems live in low-income countries and, as a result, a low level of medical care. These are mainly Asian, African, and South American countries

In Russia, according to the assessment of the Research Institute of Eye Diseases. Helmholtz, the number of blind people is about 100 thousand compatriots. Every year, about 45 thousand people across the country become disabled due to visual impairments. Approximately 20 % of visually impaired people are young people.

Based on statistical data, it can be concluded that this problem is particularly relevant in society. Modern devices, techniques and technologies are created with a focus on the organization of comprehensive social adaptation of blind people. The problems of reading, working with a computer and other gadgets have been solved. But the tasks of technological support for the independent movement of the blind and their daily tasks remain relevant. Over the past 30 years, many options have been proposed and developed to help with orientation, as well as options for partial restoration of vision functions.

Let's consider one of these options. Voice Vision is a technology that allows you to visualize the surrounding space using sound

This device was developed by scientists in the last century, but only in 2015 Russian scientists managed to create a functioning sample [2].



Figure 1. VoiceVision prototype

The mechanism of the device is entirely based on Peter Meyer's algorithm. The data of each pixel is transformed into a matrix. Vertical position - in frequency, brightness in amplitude. A pixel in a higher position corresponds to a higher frequency sound. The greater the brightness of a pixel represented by a gray tone, the greater the amplitude ("volume") the corresponding generator. The sums of signals for one column are superimposed on each other. Then each subsequent column is converted to sound. This procedure continues until the rightmost column is converted to sound. For the next frame, the conversion procedure is repeated. Figure 2 clearly shows the principle of operation of this technology.

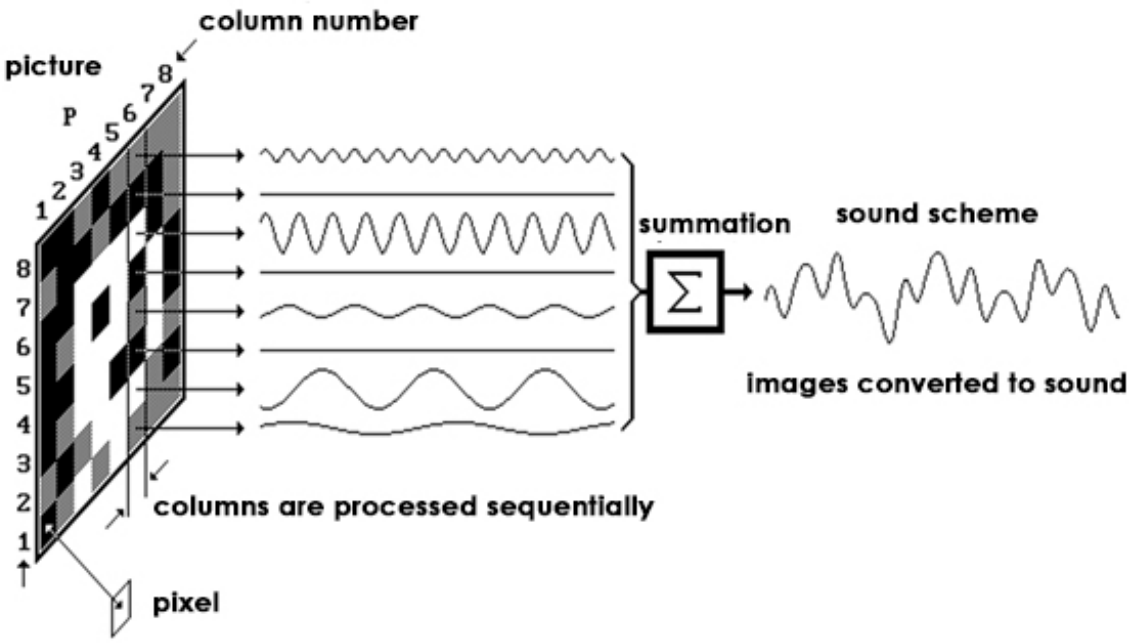


Figure 2. The principle of operation of VoiceVision

Although a limited number of samples have already gone on sale, but such devices are not sold everywhere and because of their high price are not available to everyone.

A direct contender of such a device is the BrainPort technology, which works with the human tongue to visualize the surrounding space [3].

BrainPort is a modern, state-of-the-art neurorehabilitation technology. Currently, it is actively being developed, positioned as an innovative, non-standard approach to the treatment of patients, allows you to fully recover or significantly compensate for lost or impaired functions. With the help of an electrode attached to the tongue, sensory information is transmitted to the brain.

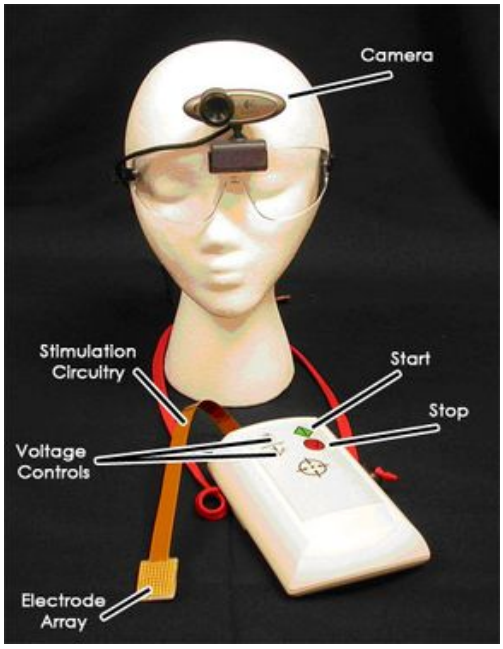


Figure 3. Brainport prototype

To produce tactile vision, BrainPort uses a camera to capture visual data. The optical information - light that would normally hit the retina – that the camera picks up is in digital form, and it uses radio signals to send the ones and zeroes to the CPU for encoding. Each set of pixels in the camera's light sensor corresponds to an electrode in the array. The CPU runs a program that turns the camera's electrical information into a spatially encoded signal. The encoded signal represents differences in pixel data as differences in pulse characteristics such as frequency, amplitude and duration. Multidimensional image information takes the form of variances in pulse current or voltage, pulse duration, intervals between pulses and the number of pulses in a burst, among other parameters [4].

The main problem of BrainPort is the impossibility of creating a matrix with a sufficiently high resolution to transmit a clearer "image" to the human language. At the moment, there is a matrix of 20 by 20 electrons, but according to Yuri Petrovich Danilov, a specialist in human sensory systems, the optimal resolution is considered to be 50 by 50 electrons [5]. Now scientists do not have such technologies. Also, a important disadvantage of BrainPort is ergonomics. The device cannot be used without direct contact with the human tongue, which can cause noticeable discomfort to the user. The last drawback of the device is unavailability for purchase. BrainPort is not produced everywhere, and the offers that are available on trading platforms have a colossal cost.

BrainPortn and Voice Vision are undoubtedly breakthrough achievements in the field of neurophysiology, but due to the large number of disadvantages, such devices cannot be used everywhere, modern technologies are not enough, so in the future scientists will have to do tremendous work for the successful widespread use of these technical devices.

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УДК 325.2

FACTORS OF EMIGRATION OF IT-SPECIALISTS FROM TAJIKISTAN TO RUSSIA

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Abstract. In the 21st century, in the age of information technology, the role of IT specialists is becoming a key factor in the development of the country. For Tajikistan, the outflow of IT specialists will be a big blow to the development of IT infrastructure. Since Tajikistan itself is currently experiencing a shortage of personnel in the IT market. The main channels of migration of IT specialists from Tajikistan are Russia.

Keywords: emigration, Tajikistan, IT specialist, Russia, labor migration.

ФАКТОРЫ ЭМИГРАЦИИ IT-СПЕЦИАЛИСТОВ ИЗ ТАДЖИКИСТАНА В РОССИЮ

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Аннотация. В 21 веке, в век информационных технологий, роль IT-специалистов становится ключевым фактором развития страны. Для Таджикистана отток IT-специалистов станет большим ударом по развитию IT-инфраструктуры. Поскольку в самом Таджикистане сейчас наблюдается нехватка кадров на IT-рынке. Основным каналом эмиграции IT-специалистов из Таджикистана является Россия.

Ключевые факторы: эмиграция, Таджикистан, IT-специалист, Россия, трудовая миграция.

The role of information technology in modern society is difficult to exaggerate. The activities of scientists of any science, medical research, banking and monetary transactions and activities in any other socially significant sphere – all this has been given the opportunity to develop and become publicly available thanks to information technologies [1].

It is difficult to imagine any sphere without information technology, and infrastructure development without IT specialists [2].

Computerization entails the need to acquire the ability to quickly and correctly receive, store and transmit information, and use it rationally. This is facilitated by the process of informatization of education, which is the introduction of information tools, information products and pedagogical technologies based on these tools into educational institutions [3].

The modern information society with its complex, high-tech and rapidly changing production, developed infrastructure, imposes qualitatively new requirements for the training of specialists of various profiles [4].

The society's need for qualified specialists who possess an arsenal of computer equipment is turning into a leading factor in educational policy. After all, people's activities increasingly depend on their awareness and ability to use information effectively. For free orientation in information flows, a modern specialist of any profile should be able to receive, process and use information using computers, telecommunications and other means of communication [5].

High-quality IT-education has long and deservedly been considered a happy ticket to life, professions in the field of information technology have been the most in demand on the labor market for many years, and the demand for them is constantly growing. Today, not only employers, but also states are striving to retain highly qualified IT specialists and attract new employees in this field. IT specialists can dictate their rules to the management and demand special working conditions, and their salaries become the envy of representatives of many other professions. However, despite the huge number of bonuses and high earnings, there is still a shortage of such specialists in the Russian personnel market.

According to the estimates of the Ministry of Digital Development, Communications and Mass Media, in 2021, the Russian shortage of personnel in the IT sector was from half a million to a million people. Companies sorely lacked qualified specialists, and this is the most frequent complaint of all top managers. The situation deteriorated sharply in 2020, when the coronavirus pandemic began. Then even organizations whose work is not related to information technology had to move to the digital sphere and rebuild internal processes to meet new realities. The sharply increased demand for IT specialists has generated a proposal: the number of vacancies in this field has more than doubled, and the number of resumes of employees in this field on job search services has increased by 42 percent by 2021. However, as market representatives note, this did not help to avoid another problem: for applicants with high qualifications and competencies, it is steadily falling, and the professional qualities of most applicants are not up to par [6].

This is due to several problems at once, including the lack of budget places in higher education institutions. High competition between regional, metropolitan and foreign companies also plays a significant role. According to Sergey Plugotarenko, director of the Russian Association of Electronic Communications (RAEC): “It is important not only to prevent the outflow of personnel to other countries, but also to

create privileged working conditions. Without the brains and hands of specialists, it is impossible to support and develop our digital economy.” [7].

Renat Lashin, Executive Director of the Russian Software Company, adds that the need for IT specialists will only increase over time, given that in the current circumstances in Russia it is necessary to actively engage in the development of its own software, and the development, implementation and support of existing projects [6].

But the situation has completely changed after the beginning of the conflict in Ukraine, IT specialists began to leave Russia en masse. However, the Russian authorities are trying to keep them, and intend to attract foreign specialists, offering those benefits and other favorable offers.

For domestic specialists of IT companies, the Russian authorities offer a preferential mortgage at 5 % and a deferral from military conscription. Foreigners who are employed in a Russian IT company or who are planning to move are offered to obtain citizenship under a simplified system.

In addition, organizations were given the opportunity to receive preferential loans at 1 % and grants for product development, and they are ready to finance projects suitable for them.

The proposed benefits will be available to both existing IT companies and new ones.

In addition to the above, Russian IT companies were exempted from income tax and inspections for three years, that is, until December 31, 2024.

Accordingly, it is now advantageous for Tajik specialists to enter the Russian IT industry market, since this market remains open due to the massive departure of their specialists.

According to the director of the Public Foundation "Civil Initiative of Internet Policy" Mukhammadi Ibodulloev: "We can say that there are three reasons that interest our specialists. Because specialists began to leave, the authorities have increased wages. The second reason is obtaining citizenship. The third reason is the lack of a language barrier. The majority of Tajikistanis, especially IT specialists, still know Russian. Thus, although the Russian market occupies a small percentage on a global scale, but the absence of a language barrier makes it attractive” [8].

Nevertheless, so far, Tajik specialists are not particularly interested in the proposed mortgage benefits, exemption from income tax or deferral from the army, since in order for them to start working in Russia in any case, they will first have to obtain a patent for the activity. In addition, the procedure for obtaining citizenship, even under the simplified version, may take six months or more. During this time, it is unknown where the Russian IT market will move.

For Tajikistan, the outflow of IT specialists will be a big blow in its infrastructure development. Since, in Tajikistan itself, there is now a shortage of personnel in the IT market [9].

However, perhaps this cannot be avoided, since it is difficult for Tajikistan to compete with Russia in attracting highly qualified specialists.

In order to retain or attract IT specialists, it is important for the Government of Tajikistan to pay attention to two fundamental factors: the development of infrastructure and the provision of tax benefits.

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ECONOMIC BARRIERS AND RISKS IN USING DRONES FOR PRODUCT DELIVERY

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Abstract. This article discusses the economic factors and risks that complicate the use of drones for product delivery. Conclusions are made about the reasons why drone delivery is not rational and feasible at the moment.

Keywords: drones, delivery, economic problems, economic risks.

ЭКОНОМИЧЕСКИЕ БАРЬЕРЫ И РИСКИ ПРИ ИСПОЛЬЗОВАНИИ ДРОНОВ С ЦЕЛЬЮ ДОСТАВКИ ПРОДУКЦИИ

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Аннотация. В данной статье рассматриваются экономические факторы и риски, осложняющие использование дронов для доставки продукции. Сделаны выводы, по каким причинам доставка дронами на данный момент не рациональна и нереализуема.

Ключевые слова: дроны, доставка, экономические проблемы, экономические риски.

Transportation is a promising line of business, so automation plays an important role in this business. The faster the order reaches the recipient, the higher the profit of the organization. Today there are many companies providing transportation and logistics services. High competition forces the owners of forwarding companies to find new ways to improve efficiency, consider innovative technologies related to safety, speed, accuracy, continuity. Responding to the growing needs of not only international, but also local customers, the air cargo industry is evolving to create new types of technological solutions [1]. Today unmanned aerial systems (UAS) based on

unmanned aerial vehicles (UAV) are becoming such solutions. The rapid development of such types of technological solutions leads to changes in business models in many areas, including mail, courier services, etc. In this regard, the world's largest companies are competing for the right to lead in the segment of unmanned transportation systems.

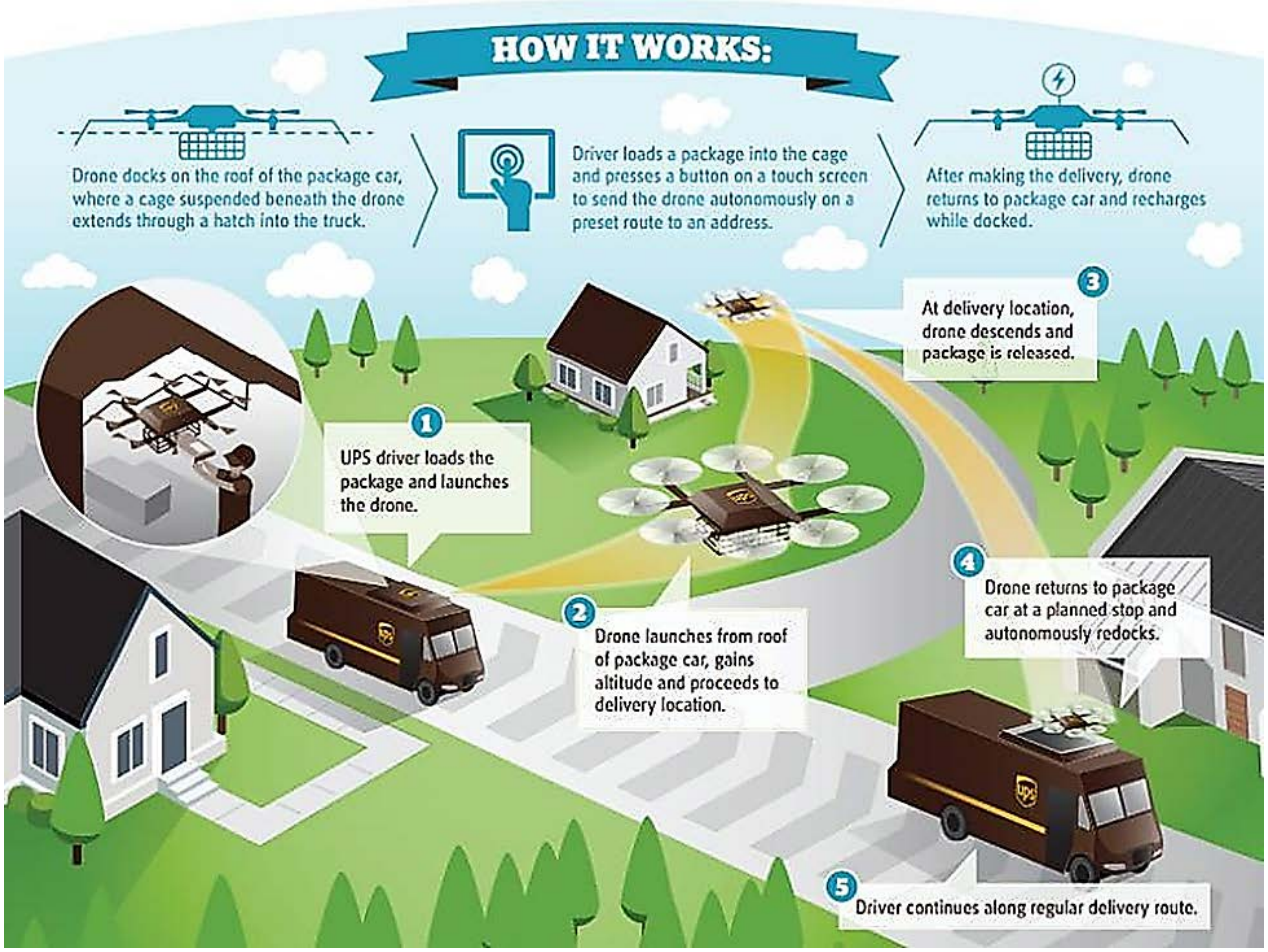


Figure 1. The way drones deliver

Remotely piloted unmanned aerial vehicles – drones appeared with the invention of radio. The creation of the first working prototype is associated with the name of the famous inventor Nikola Tesla. The device did not fly yet – it floated in a pool, but it executed commands correctly, which shocked the New York public in 1899.

During the First World War, there was a lot of development of flying drones, but they were not involved in combat operations. The first full-fledged unmanned aerial vehicle was created in 1935 based on the Queen Bee biplane.

In the 21st century, it seems as if mankind has finally “discerned” the prospects for the use of flying drones for civilian purposes. In the last decade, their number has grown rapidly, outstripping the boldest forecasts [2].

One of the most notable trends today is the use of drones for logistics purposes. Two trends prevail here: warehouse drones that read barcodes on packages, and drones for last-mile delivery. December 7, 2016. Jeff Bezos, founder of “Amazon”, the world's largest online retailer, notified the media of the first drone delivery. A customer in the U.K. ordered a set-top box and popcorn. It took 13 minutes from the time of the order

to the delivery of the goods. However, the priority in this area is disputed by the logistics company DHL, which claims to have organized drone delivery back in May 2016, its primacy, in turn, is disputed by “Google”, and modestly aside, the Russian company “DoDo Pizza”, which delivered the first food by drone back on June 21, 2014 in Syktyvkar, is listening to these discussions.

While the use of drones for delivery is promising, there are a number of challenges in implementing such technology. The first problem is that the Federal Legislation of the Russian Federation, namely 54-F3, establishes that payment for goods upon receipt, ordered via the Internet, is only possible with a cash register, since the purchase must be accompanied by the transmission of a receipt. The check, of course, can also be electronic, but cash registers are not yet able to work fully properly without a person. A lot of people faced with the problem of terminal failure, for example, in vending machines, in this case the equipment could not be used until the arrival of a specialist. In this case, the payment terminal should not have vulnerabilities in order to be constantly in working condition. Consequently, at the moment the drone has no such function, which makes its use available only for paid parcels. In addition, drone deliveries involve prepayment. And there are fewer such orders when you consider the total number of goods delivered. The practical possibility of equipping each drone with a cash register is not yet possible [3].

The second problem is securing drones against tampering on the ground and in the air. The drone is not secure, so it is susceptible to theft along with the cargo it carries by interception, which is responsible for compensating money. Also, the software, in which the control and management of the machine is carried out, is also still imperfect, and has shortcomings, due to which there is a high probability of cyber-attacks on the system [4].

The third problem is the cost of drones. Drones are still in development, which speaks to their high cost. For example, the Aerigon drone (Figure 3) is one of the best but one of the most expensive drones on the market for commercial use, and it is also capable of performing delivery tasks [5]. The price of this drone is $250,000 when fully equipped. Another example is the DJI Phantom 4 drones (Figure 2). They are a class of their own – drones can stay in the air longer, can avoid obstacles, have a user-friendly control system and more. However, the cost of such a machine reaches up to $40,000 [6].

The fourth problem is expensive software and sensors for additional tasks. Since there are not always ideal flight conditions, the drone must be ready for different weather conditions (rain, snow, hail). Also, wind changes greatly affect the control. To compensate for the effects of the environment, a lot of sensors are needed to condition the drone. Difficulties also concern the delivery to high-rise buildings, business centers, because it requires writing special sophisticated software to organize this process. However, the price of this is high - about $5,000-9,000 per platform, not including the work of the operator, who will build the necessary logistics through the program. Expenses for drones compared to the salary of the courier and reimbursement of gasoline are enormous. Also necessary is the installation of distribution centers, which should be within a radius of 10-15 km.



Figure 2. DJI Phantom 4



Figure 3. Aerigon

Despite the successful experience of using drones in some countries, there are many economic barriers and risks to the development of this industry in Russia. The use of such technology, which is at such an early stage of development in this field, will definitely not be economically affordable to use drones as a substitute for existing delivery methods. The automation of this industry is temporarily limited to economics and requires development in the rest of the sciences.

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SOCIAL NETWORKS AS A TOOL OF NEGATIVE INFLUENCE ON A PERSON

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Abstract. The paper describes negative aspect of influence social media have on a person. The author analyzes how the social media addiction appears and what it leads to.

Keywords: social network, addiction, Internet, computers, smartphones.

СОЦСЕТИ КАК ИНСТРУМЕНТ НЕГАТИВНОГО ВЛИЯНИЯ НА ЧЕЛОВЕКА

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Аннотация. В работе рассматривается негативный аспект влияния социальных сетей на человека. Автор анализирует появление зависимости и вытекающие из нее проблемы у пользователей социальных сетей.

Ключевые слова: социальная сеть, зависимость, Интернет, компьютеры, смартфоны.

The smartphone with a touch screen appeared in our lives about 15 years ago and since then we couldn't take our eyes off it. According to statistics, a large majority (72.3 %) of mobile time people spend on social media. According to the latest data, the average amount of time spent on social media worldwide is two hours and 27 minutes a day in 2022. This is the highest time ever recorded [1].

Summary, social networks are harmful and even dangerous for your mental health. Social network addiction is an extremely common problem. People have trouble putting their phones down. A study found that 94 % of participants reported feeling troubled when they didn’t have their phone. 80 % were jealous when someone else used their phone and 70 % expected to feel depressed, panicked and helpless if their phone went missing or they couldn’t find it. The fact that everybody has a problem

does not mean it’s normal.

This very addiction is called a behavioral addiction [2].

What makes us give social media that much of our time? Do we actually get amused and happy just by scrolling feed or is it just a waste of time?

1. Social media causes depression.

Social media can demonstrate bullying, unrealistic expectations about body image, success and life in general, which can be detrimental to mental health.

People often compare themselves with unrealistic pictures from social media. Even when the image of success is real, people do not see any background of this success (obstacles, hard work, failures). This makes people think there is something wrong with them if they cannot get it immediately. For those vulnerable to developing an eating disorder, social media may be especially unhelpful because it allows people to easily compare their appearance to their friends, celebrities, even previous images of themselves.

Young people’s brains are still developing, and as individuals, young people are developing their own identities. What they see on social media can define what is expected in ways that is not accurate and that can be destructive to identity development and self-image. Social media can lead to even more tragic consequences such as depression. Most of the people start using social media to feel connected to others and valuable. However, the study found that the less people use social media, the less depressed and lonely they feel. Human beings need face-to-face contact to be mentally healthy. You always need eye contact with the ones who care about you. Prioritizing social media above interaction in real life develops or exacerbates mood disorders such as anxiety and depression [3].

Adolescence is a time of risk-taking, which is both a strength and a vulnerability. Social media can exacerbate risks, as we have seen played out in the news.

2. Social media affects your sleep, memory and attention span.

Scrolling social media has become a common pre-sleep activity among most of the users. It may feel relaxing, but the blue light of phone screens impacts sleep quality. It signals to the brain that it’s daytime and sleep becomes delayed. Going to bed is a sign for your brain to prepare for sleep, but scrolling social media provides you an endless stimulation that makes your body remain active [4].

Spending time on social networks worsens your memory. Heavy use of them affects transactive memory which involves deciding which information is important enough to be stored in your brain and which can be outsourced. Posts we make on social networks erase a part of the real experience. According to the research by Diana Tamir of Princeton University, those who wrote down, recorded or shared their experiences performed about 10 % worse on memory tests across all experiments [5].

Social networks decrease attention span. Attention span is the amount of time spent focused on a task before becoming distracted. Our neurons are firing all day long because of an unlimited ability to access information. This leads to multi-tasking, which destroys our ability to focus on one task at a time [5].

3. You become dopamine addicted.

Using social media can lead to physical and psychological addiction because it triggers the brain's reward system to release dopamine, the "feel-good" chemical. It's the same chemical our brain releases when we eat, have sex, gamble or explore social media.

Social media platforms are designed to snare your attention keep you online and have you repeatedly checking your screen for updates. It's the way of making money for our attention by selling ads. But much like addiction to nicotine, alcohol or drugs social media use can create psychological cravings.

When a user gets a like, a retweet, an emoticon notification, the brain receives a flood of dopamine and sends it along reward pathways. It feels wonderful, but it also acts to reinforce our need to satisfy the feeling next time. Yes, they get their dopamine, but in an easy way which makes dopamine poor. This cycle of motivation, reward and reinforcement is a "dopamine loop" that gets users seeking, looking and craving rewards and more of them [6]. There is one more thing that makes us practically addicted to social media: fear of missing out or FOMO. The fear of missing out is a social anxiety based on the belief that others can have fun while the person experiencing anxiety is absent. Social media can also give users a case of FOMO, for example, if they were invited somewhere but couldn't go for some reason. Or if the friend didn't invite them at all, users might feel hurt and left out to see that others in their social circle were. It can lead them to question their friendships or their own self-worth.

Even though you know that images on social media are fake, manipulated, they can still make you feel insecure about yourself and jealous.

Similarly, we're all aware that other people tend to share just the highlights of their lives, rarely the low points that everyone experiences. But that doesn't lessen.

This activates those feelings of envy and dissatisfaction when you're scrolling through photos of people who make something exciting.

Everyone is different and there is no specific amount of time spent on social media that indicates your use is becoming unhealthy. For example, your social media use may be problematic if it distracts you from work or school, or leaves you feeling envious, angry or depressed. Similarly, if you're stuck on using social media to make others jealous or upset, or use it just because you're bored or lonely, it may be time to reassess your social media habits [2].

4. Social media is harmful for your data security.

Social media is also a quick way to spread fake links with viruses, malware and scam. Cybercriminals often fake the log in pages, making you enter your password and gaining access to your personal information. Your information can be used by hackers or online criminals for a variety of purposes, for example to blackmail or impersonate you. Your profile is an open source for them. More than that, social networks collect your search history data. Even your voice messages are being bugged. Social media algorithms know exactly what you need and show it on a main page.

Privacy agreements on social media state that anything you post is their property even if you decide to delete your account. This means your intellectual property is

simply just a small part of what, for example, Meta owns [7].

However, there are multiple ways of getting rid of social media addiction. This whole recovery process is called digital detox.

1. Turning off the notifications. Every notification makes your phone screen light up, which makes it impossible not to distract. Leave the phone muted for several hours.

2. Not putting the phone near the bed. A phone should be placed out of your reach.

3. Removing the phone from morning routine. Never check the phone after waking up.

4. Creating no-phone areas. For example, banning any screens from bedrooms.

5. Limiting screen time in social media apps. Certain phones, including IPhones, are able to limit the usage of applications during the day.

6. Find yourself hobbies outside your phone. There is always something to do [8]. To sum up, we can see that social media is a modern illness which impacts all the aspects of a person's life. Social media addiction remains one of the most relevant problems of a post-industrial society, and realization is the first step to curing this disease.

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CHEMICAL STRUCTURE AND FEATURES OF HUMIC ACIDS THE EFFECT OF HUMIC ACID-BASED DRUGS ON THE HUMAN BODY

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Abstract. This article discusses the chemical structure, structure, and properties of humic acids. The features of their interaction with other substances are presented. The effect of humic acid-based drugs on the human body is described. The problem of the study of humic acids and humin-like compounds and their application in medicine is also raised.

Keywords: humic acids, high-molecular compounds, biological activity, humin-like substances, humus.

ХИМИЧЕСКОЕ СТРОЕНИЕ И ОСОБЕННОСТИ ГУМИНОВЫХ КИСЛОТ. ВЛИЯНИЕ ПРЕПАРАТОВ НА ОСНОВЕ ГУМИНОВЫХ КИСЛОТ НА ОРГАНИЗМ ЧЕЛОВЕКА

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Аннотация. В данной статье рассмотрены химическое строение, структура, свойства гуминовых кислот. Представлены особенности их взаимодействия с другими веществами. Описано влияние препаратов на основе гуминовых кислот на организм человека. Также поднимается проблема исследования гуминовых кислот и гуминоподобных соединений и применения их в медицине.

Ключевые слова: гуминовые кислоты, высокомолекулярные соединения, биологическая активность, гуминоподобные вещества, гумус.

Humic substances occupy a special place among biologically active substances of natural origin and are polydisperse biopolymers of complex structure with high molecular weight. Important biological functions and widespread occurrence in nature determine the great interest in humic substances shown in recent decades. On the basis of humic substances, various preparations for agriculture, veterinary medicine and a

number of biologically active additives used in medical practice have been created. Humic substances are complex systems of high–molecular organic compounds of natural origin, representing multifunctional structures of aromatic, alicyclic and heterocyclic nature, replaced by alkyl chains with various functional groups. The complexity of the structure of humic substances is caused by various factors and conditions of their formation. The methods that are used to extract humic substances from natural objects have a significant impact on both their composition and properties. Unlike most biologically active compounds of natural origin, the biosynthesis of which is genetically determined and ordered, the formation of humic substances occurs randomly. Bottom organic residues decompose to simpler compounds, from which the synthesis of complex organic substances occurs, accompanied by condensation and polymerization of the initial compounds [1]. Synthesis and decomposition reactions are almost continuous. As a result, the most stable compounds accumulate. Humic substances include low molecular weight organic acids, amino acids, carbohydrates, lipids and products of their transformation, the so-called "young" humin-like compounds, which, undergoing further oxidative polymerization, turn into humic acids.

These compounds are poorly understood. During the interaction of humic acids with divalent and trivalent cations (Ca^{2+}, Mg^{2+}, Al^{3+}, Fe^{3+}) precipitates are formed, and with monovalent cations (K^+, Na^+, NH_4^+) humic acids form water-soluble salts – humates. Humic acids are high-molecular, multifunctional compounds of aromatic, heterocyclic and alicyclic nature. Recently, humic acids have been considered as self-organizing supramolecular systems of molecules of variable composition and irregular structure.

It was found that humic acids contain 45-60 % carbon, 30-35 % oxygen, 3-7 % hydrogen, 3-5 % nitrogen, 1-3 % sulfur and metal ions, the composition of which largely depends on the source of the formation of humic acid.

The complexity of the structure of humic acids, the presence of a large number of functional groups, the ability to form intermolecular and intramolecular bonds determine a wide range of interactions that humic acids can enter into. The presence of groups such as carboxyl, carbonyl, phenolic and hydroxyl groups in combination with aromatic structures ensures the ability of humic acids to ionic and donor-acceptor interaction. Humic acids are actively involved in sorption and redox processes [1].

Humic acids are heteropolymers of supramolecular structure, are an integral part of objects of natural origin (therapeutic mud of silt and sapropel types, peat and coal fossils) and have a fairly diverse biological activity. In the last decade, there has been a need to develop such drugs based on therapeutic mud, which, while maintaining the high therapeutic activity of native mud, are freed from the negative aspects of classical peloid therapy. Most of the well-known peloidon preparations (FiBS, Gumizol, Peat, etc.) are now produced by foreign companies. Since humic acids are an integral part of objects of natural origin, currently one of the leading areas of research development is the study of physicochemical, biochemically aspects of their structure and activity in order to obtain new highly effective peloid preparations. One of the main problems in the development of the theory and practice of the use of peloid preparations is the lack of knowledge of humic acids (as components of peloids), which determine their

therapeutic effectiveness. On the other hand, anthropogenic pollutants found in native peloids can be separated only in the process of high-tech processing with the release of physiologically active components. Humic acid preparations are alternative for people with contraindications to native mud treatment, and the creation of original pharmacotherapeutic drugs with anti-inflammatory, biostimulating and reparative properties, cosmetics based on Humic acids and humic-like substances remains an urgent and priority area of research in world science. A rather promising approach to eliminate the shortage of high-quality therapeutic for the needs of balneotherapy is the use of regional resources. In this context, the development of drugs based on [2].

Humic acids are a long molecular chain isolated from soils, peat and brown coal. If they are combined with fulvic acid, a bioavailable complex of minerals is formed. It contains more than 20 amino acids, various vitamins, fatty acids, natural polysaccharides, sterols, hormones, plant pigments. It also contains phytoestrogens. Phytoestrogens are compounds of plant origin that chemically resemble estrogens, but act much weaker.

The high catalytic activity of humic acids in the disproportionation of superoxide was noted, which determines the essential importance of the biological role of these compounds. The assumption that humic acids are suppliers of hydrogen ions for enzymatic reactions is well-reasoned, correlates well with the content of aromatic fragments in humic acids and the number of free radicals caused by the presence of semiquinone fragments. The more pronounced the conjugation system of humic acids and humin-like substances is, the more their biological activity manifests itself. From this point of view, it is possible to explain the anti-inflammatory effect of humic acids and preparations based on them. Semiquinone ions formed as a result of the charge transfer complex are capable of interacting with peroxide compounds, the excessive formation of which accompanies the inflammatory process, thereby reducing their content. These ideas are in good agreement with another fundamental property of humic acids – their electron paramagnetism. It is noted that paramagnetic activity, which is understood as the concentration of free radicals, can most characterize the overall level of biochemical activity and biothermodynamic stability of humic acids. The analysis of a large number of GC isolated from peat samples from geographically different bogs located on the territory of Russia showed the proximity of the parameters of the electron paramagnetic resonance (EPR) spectra ($g = 2.0035 \pm 0.0002$), and the differences are related only to the nitrogen content. Despite the fact that, according to a number of researchers, the main polyphenolic complex of chaga is humin-like chaga acid, there is a different point of view [3].

From all of the above and not only it is possible to draw conclusions about the effect of humic acids on the human body. They have a high therapeutic effect and are useful substances in the diet.

Properties of humic acids, useful for the human body:

1. Suppress the activity of viruses. Humic acids prevent their penetration into cells. They also activate the defenses of the immune system, as a result of which it copes faster with aggressors, pathogenic bacteria. Since humic acids do not allow viruses to enter the cell, they can be used for preventive and therapeutic purposes during colds.

2. They are characterized by antibacterial activity. Humic acids destroy pathogenic microorganisms and, together with toxins, are excreted naturally without intoxication. 3. These compounds are a powerful enterosorbent. Compared with drugs of this action, they are more intense and effective, quickly eliminating diarrhea and other digestive disorders. Humic acid covers the intestinal mucosa with a protective film, preventing toxins and harmful substances from entering the blood. The rich composition of acids allows them to participate even in digestion, helping enzymes to break down nutrients.

4. Increase the efficiency of the immune system.

5. Humic acids are indispensable for humans if it is necessary to accelerate the healing of wounds and ulcers. Reduce the rehabilitation period for fractures and bruises, arthritis, arthrosis.

6. Since humic acid is able to recognize and remove lipoproteins and cholesterol, it can be effectively used in the fight against atherosclerosis, which often causes heart attacks and other cardiac pathologies.

7. Humic acid has an anti-allergic effect, because it binds and removes allergens from the body. The symptoms of pathology pass quickly, remission occurs for a long time. And with constant intake, complete recovery is possible.

From all of the above, we can conclude that if you take humic substances, the benefits for a person will be enormous.

The main obstacle to the spread of drugs based on humic substances in medicine is the complexity of their standardization. The development of drugs at the preclinical stage involves the establishment of the structure of the active compound and the determination of optimal methods and methods of its standardization for quality control. However, the knowledge about the composition and structure of humic substances available today is not enough to spread to them the ideas generally accepted in pharmacology and pharmacy about the substances of medicines. In addition, when developing methods for standardization of medicines of natural origin, the principle of unification of methods for qualitative detection and quantitative determination of active components in the series "raw material – substance – drug" should be observed.

In general, the properties of humic substances have not been studied sufficiently, since there is no generally accepted methodology for the study and assessment of the quality of humic substances due to the complexity of their chemical structure, polymorphism of composition and associated certain difficulties in identifying individual fractions. As a result, not a single medicinal product based on humic substances has been registered in the State Register of Medicines of the Russian Federation. The development of methodological foundations for the standardization of humic substances in the series "raw material – substance – preparation" is an urgent task. It also remains relevant to conduct research on the development of a method for modifying humic substances at the isolation stage in order to reduce their molecular weight, increase solubility and the number of different functional groups in the structure of molecules, which, in turn, can increase the bioavailability of humic compounds. The introduction of medicinal products based on humic substances involves the study of their chemical and pharmacological properties, the development

of modification methods and the selection of standardization criteria for both the raw source of humic compounds and the humic substances themselves [4; 5].

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MODERN METHODS OF TEACHING ENGLISH IN PRESCHOOL INSTITUTIONS

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Abstract. This article discusses modern methods of teaching English in preschools. At the present stage of development of society, the modernization of the content of education is closely connected with innovative processes in the organization of teaching foreign languages. Therefore, the issue of applying new information technologies in the education system is very relevant. This is a new approach to the learning process, new forms and methods of learning.

Keywords: preschoolers, teaching, practical mastery, English language, modern methods, development of society.

СОВРЕМЕННЫЕ МЕТОДЫ ПРЕПОДАВАНИЯ АНГЛИЙСКОГО ЯЗЫКА В ДОШКОЛЬНЫХ УЧРЕЖДЕНИЯХ

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Аннотация. В статье обсуждаются современные методы обучения английскому языку в детских садах. Модернизация образовательного содержания на нынешнем этапе развития общества тесно связана с инновационными процессами в организации преподавания иностранных языков. Поэтому проблема применения новых информационных технологий в системе образования очень актуальна. Это новый подход к процессу обучения, новые формы и методы обучения.

Ключевые слова: дошкольники, преподавание, практическое овладение, английский язык, современные методы, развитие общества.

Foreign languages are becoming increasingly popular and acceptable in everyday life. Knowing many languages is useful, and this article also states that one of the most widely spoken languages of international communication is English. Learning English Moderna has become popular among modern society. Foreign language has become a compulsory educational subject not only in schools, but also in many additional kindergartens. In terms of psychology and pedagogy, preschool age is

the best time to start learning a foreign language. Based on this, we can conclude that the sooner you start learning a foreign language, the more efficient, faster and easier it will be transmitted, and the calmer you will be able to learn more languages in the future. The problem is that these cute creatures are willing to do different things with pleasure, but only those that they love. Teaching children does not seem easy. Although a teacher of children 2-5 years old does not have to teach them to combine complex tenses, irregular verbs – use participles-he must know many effective ways to attract their attention and increase interest in English. There are many modern methods of teaching English, but only a few are effective [1, p. 173].

The main method used in kindergarten by children of preschool and school age is the game method, knowledge of the features of the language and application in practice. The most important thing in teaching children English is the knowledge that interests them, involves them in the process, and for young children the most fun process is the game. For a child, play is life. It can be said that English learning games for children are the main form of learning foreign languages. They create a random situation that is easier to teach than forced teaching methods. During the game, children not only memorize new words, expressions or rules, but also develop attention, memory, thinking and, of course, creativity. The use of games in learning helps to maintain interest in English, and also facilitates the learning, consolidation and assimilation of lesson material. The gameplay itself is also suitable for learning, in such an environment information is perceived better than in a lesson. This in itself is joyful and rewarding. This is the best way to teach English to preschoolers. With the game you can achieve unprecedented success in learning children. The most elementary education, that is, preschool teaching of Languages and other subjects, must of course begin with game methods. The advantage of this method is that it helps to form a strong love between the teacher and the child, and that the stimulation of feelings helps the child to know his personality and grow comprehensively, and that this method of unusual upbringing educates children with a special mentality. Modernization of educational content at the present stage of the development of society is closely related to innovative processes in the organization of teaching foreign languages. Therefore, the problem of applying new information technologies in the education system is very relevant. It is a new approach to the learning process, new forms and methods of learning. The main goal of teaching foreign languages is the formation and development of the communicative culture of preschoolers, the teaching of practical mastery of English. The ECE lays the fundamental foundation for learning English for preschoolers. The main task of an Early childhood education specialist is to develop the cognitive interests and abilities of preschoolers, teaching elementary communication skills in English. The teacher of English must create conditions for the practical acquisition of the language for each student, select and use forms and methods of teaching that allow the student to show his activity, creativity [2, p. 46].

The application of ICT to direct learning activities in a foreign language develops two types of motivation: self-motivation, in which the material offered is interesting in and of itself, and motivation, which is achieved by demonstrating to the

preschooler the ability to understand the studied language. It is satisfying and instills confidence in your strength and desire to improve further. Information and communication technology in learning English in kindergarten. The most relevant are information and communication technologies: Audio, video, media players and various types of games in which children learn to dialogue. The use of audio, video stories, fairy tales, cognitive material in educational activities directly contributes to the individualization of learning and the development of motivation for speech activity of preschoolers. It is much more fun for children to listen to or watch a fairy tale, story or educational film than a resume. They quickly understand the semantic basis of language and begin to speak for themselves. The subconscious of the child is especially sensitive, and even if the obvious result is not visible now, it is possible that in a year or two the child will meet especially developed speech skills. You can highlight all the information means used directly in educational activities with preschoolers: - audio, - video, - multimedia devices. Audio tales to learn English. When the vocabulary of a preschooler reaches several dozen words, you can directly diversify the educational activity with the help of audio fairy tales in English. Audio fairy tales are a great help for children in learning English. Starting with small English stories. For example, such tales as" three little kittens"," three little pigs "or"too many pigeons". Audio stories combined with visual material. When a sonorous fairy tale sounds, the children look at the pictures with the teacher and pronounce the words at the same time [3, p. 233].

The game plays an important role in a child's life. Through the game, he knows the world. The game restores life roles, situations, social experience, as a result of which the child learns a certain type of behavior. To form a communicative culture of the preschooler, various game technologies are used. Internet resources. As practice shows, this type of learning helps to implement an individually oriented approach to education, provides individualization and differentiation of education taking into account the individual abilities of children. The possibilities of using Internet resources are huge and varied. There is a lot of information and resources on the Internet, such as instructional videos; Cartoons in English; the ability to publish projects and articles of copight One of the main requirements when teaching foreign languages using Internet resources is the creation of interaction in one lesson, in the technique it is called interactivity. The Internet helps in the formation of language skills, as well as in the teaching of vocabulary and grammar, provides interest and efficiency. An interactive approach in the virtual space is one of the means of achieving a communicative goal in the classroom. The main means of using Internet resources in preschool educational institutions is the computer. In the hands of an experienced creative teacher, it helps to improve the quality of knowledge. The distinctive features of digital educational resources are visibility, high wealth of information and mobility. Moderna information technologies allow to organize game forms of learning, in particular, leading games – activities for preschoolers, effective interaction between children. It is important to understand that using ICT alone cannot solve all learning problems. Teachers are not required to work with him constantly, in every lesson. But without a doubt the use of computer technology makes classes more fun, dynamic and efficient. Early learning

English promotes fluency in a foreign language and has great intellectual and moral potential. Mastering any foreign language is useful to all children, regardless of their abilities, since it positively affects the development of memory, imagination, thinking of the child, and also contributes to the development of his speech skills. We must not forget that a computer cannot replace a teacher in the classroom. The time of use of the computer should be carefully planned and used when necessary. The main goals of the use of ICT in English lessons in a preschool institution are: – increase motivation for learning a foreign language; – expand knowledge of the culture, traditions and customs of the studied language country; – development of language skills. The teacher can use the computer at all stages of learning: during the Introduction, fixing, repetition of new material. ICT can be used in different ways, it all depends on the creativity and skill of the teacher. The main thing is to understand what the computer is for and what results its work gives the teacher [4, p. 206].

The use of an interactive whiteboard in an English lesson allows you to organize a brighter, non-standard form and content than in a traditional lesson. The use of Interactive whiteboards in combination with audio and video media allows you to implement the principles of visibility and consistency of the material. The advantage of an interactive whiteboard is the ability to combine proven techniques and techniques of the classic whiteboard and features of multimedia capabilities, rather than the display mode as in conventional presentations. The purpose of the study: to consider the concept of "interactive play" as a means of teaching English. Presentation of the main material of the article. To date, the most urgent problem in the field of education is the increase in the quality of teaching the English language, the increase in the level of knowledge of students. More and more often, they use new approaches and technologies that increase the motivation of students, thereby increasing the knowledge of the foreign language. The use of the interactive whiteboard in lessons allows the introduction of completely new pedagogical methods and developed over the years, since the interactive whiteboard combines both new methods and technologies and a simple classic whiteboard. The concept of modernization of Modern education includes the following areas: modern educational standards are aimed at the formation of professional skills. These skills are a body of knowledge and mechanical mastery of professional skills, as well as a specific set of qualities such as: sociability, determination, the ability to use personality traits, activity and creativity at work. The priority remains the preparation of the younger generation for an evolving and accelerating information society in today's information society. At the same time, great importance is attached to new pedagogical tasks that determine the prospects for the development of education. To arouse the interest of preschoolers in learning a foreign language, it is necessary to increase their motivation for classes and increase their activity during the lesson. Modern education Information technology plays a crucial role in modern education. Such classes are subject to certain requirements: visibility, brightness, emotionality, a change in activity that ensures the activity of students in the lesson, one of the main roles is assigned to the teacher, who acts as an organizer and adviser to the entire educational process. Thanks to an interactive whiteboard, many of

these requirements can be implemented using an interactive whiteboard. It has been proven that the use of such technologies increases the efficiency of the assimilation of information by students. With the aim of increasing the level of assimilation of the discipline, students increased interest in interactive technologies in the context of the search for new modern methods and forms of work, which in turn promote more effective learning and better consolidation of the material. One of the most popular innovations was the use of the interactive whiteboard in the classroom due to the clarity and dynamism of the presentation of the material. Of course, you can do better by using a whiteboard like this in your English lessons. The combination of an interactive whiteboard with audio and video tools allows you to put into practice the principles of visibility, accessibility and systematic presentation of the material. The advantage of such a whiteboard is that it implements not only the display mode, as when using presentations, but also the ability to write with a marker, which in turn combines techniques and techniques of work with a simple whiteboard. With the help of an interactive whiteboard, it is easy to involve preschoolers in the process of active learning and create conditions for improving the efficiency of frontal work, which will increase the activity of preschoolers in the classroom. To achieve the desired result, students are encouraged to work with the following types of material: viewing and listening to the material, writing explanations, selecting, moving and creating objects, grouping, physical education and other activities [5, p. 462].

However, there are some problems with the interactive whiteboard: its high cost and the difficulty of working with this type of equipment, making it difficult to mass distribute this type of equipment in kindergartens. However, even in institutions where whiteboards are purchased, the question of their use is acute: due to the lack of completeness of the equipment (each group must be equipped with whiteboards) and software. The process of introducing an interactive whiteboard into the educational process is not sufficiently studied in the pedagogical and methodological aspects, the consideration of this issue is part of this scientific work. However, the introduction of Interactive whiteboards in the learning process has its own characteristics and limitations. The criteria characteristic of the modern educational model include continuity, design, distance, dialogism, orientation of the educational process not only on the logic of the Modern, but also on the specificity of the perception of audiovisual information. In order for the new educational model to be successful, it is necessary to completely reorganize educational institutions in accordance with information, communication, audiovisual and interactive technologies. You can use an interactive whiteboard to increase the motivation of preschoolers in English lessons. Thanks to these technologies, children actively participate in the learning process, motivation for learning increases significantly, creativity is stimulated, and the child's personality develops. Interactive learning allows you to expand the possibilities of transmitting information, its availability and systematic presentation of the material, helps to teach children taking into account their individual characteristics.

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SHALE GAS IN THE USA – TECHNOLOGY AND PRODUCTION EFFICIENCY

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Abstract. Shale gas is one of the main energy resources in the USA. The article discusses gas production technologies, as well as analyzes its efficiency for the development of this industry on an industrial scale.

Keywords: shale, shale gas, shale revolution, conventional gas, reserves, production, industry.

СЛАНЦЕВЫЙ ГАЗ В США – ТЕХНОЛОГИИ И ЭФФЕКТИВНОСТЬ ДОБЫЧИ

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Аннотация. Сланцевый газ является одним из основных энергоресурсов США. В статье рассмотрены технологии добычи газа, а также проанализирована его эффективность для развития данной отрасли в промышленных масштабах.

Ключевые слова: сланцы, сланцевый газ, сланцевая революция, традиционный газ, запасы, добыча, промышленность.

At present, the rapid development of human civilization is taking place, new technologies are being mastered, and equipment is being improved. The development of the technical sphere is taking place at a high pace, as a result of which the demand for natural resources increases. One of the main energy resources in the modern world is shale gas.

Shale is a fine-grained layered rock, formed by volatile sedimentary rocks, containing clays, quartz, calcite and other materials, as well as organic deposits. Shale gas is a close presence stored as a small gas of gas formations in the thickness of a shale-sized sedimentary rock extent [1].

Comparing shale gas with the image, we can conclude that the main difference is in the specifics of the birthplace. Shale gas occurs in sedimentary rocks.

Conventional natural gas, in turn, is produced from its special gas-bearing deposits, as well as gas hydrates. This factor predetermines various differences between the types of fuel under consideration. Such as, in particular:

− Production technology;
− Well resource;
− Quality of produced gas;
− Cost [2].

The presence of gas in lances was first discovered in 1821 in the bowels of the United States. The discovery belongs to William Hart, who, while exploring the soils of New York, stumbled upon an unidentified object. They talked about the discovery for a couple of weeks, after which they forgot, since it was easier to extract oil – it itself poured onto the surface of the earth, and shale gas had to be somehow extracted from the depths. However, serious mining and production of shale gas began in 2000 in the state of Texas using the latest technologies. Tom Ward and George Mitchell developed a strategy for the large-scale production of natural gas from shale in the USA. Devon Energy Corporation, oil and gas company in the USA, took it upon itself to bring it to life, and it started from the Barnett field. The business began, and it was necessary to develop technologies in order to increase production and increase profits. In this regard, in 2002, a different drilling method was used in the Texas birthplace. The combination of directional development with horizontal developments has become a major development in the gas industry. Now the concept of “fracking” has appeared, thanks to which shale gas production has increased several times. In 2009, the so-called "gas revolution" took place in the United States, and this country became a leader in this type of conventional fuel – more than 745 billion cubic meters [3].

A feature of shale gas production is the technology of horizontal drilling. The bottom line is that after one vertical well has been drilled to the depth of shale gas, the drill must go horizontally. However, there are many nuances that must be observed when drilling, for example, it is necessary to monitor the inclination angle of the shale reservoir. Mining companies use this opportunity, since the gas lies at a depth in isolated pockets in small volumes.

Since shale gas lies in a rock with low porosity, it is impossible to extract it using traditional methods. That is why the technology of hydraulic fracturing (fracking) is actively used to extract shale gas. Water, chemicals (corrosion inhibitors, thickeners, acids, biocides and many other chemical elements, the total number of which can reach up to 90 items) and special granules with a diameter of 0.5–1.5 mm, which can consist of made of ceramic, steel, plastic or grains of sand. All this mixture creates a chemical reaction, which leads to hydraulic fracturing. As a result, many small cracks are formed in the rock that contains the gas, in which the granules get stuck so that the cracks can no longer converge. Then the water is pumped back (it is filtered and reused for a new hydraulic fracturing), and shale gas, due to the pressure drop, is pumped through the pipes to the surface [4].

Shale gas extraction is carried out in five simple steps (Figure 1) [5].

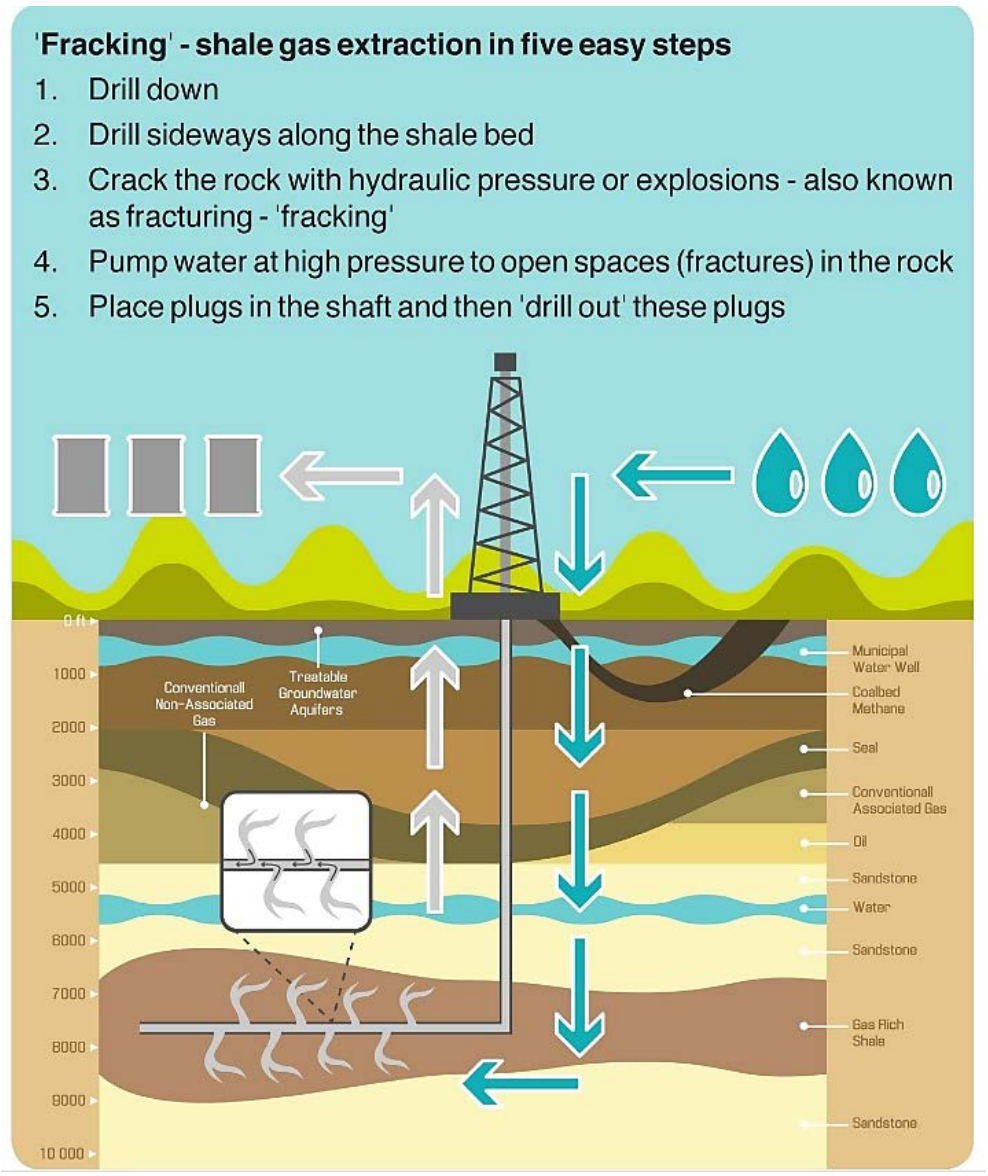


Figure 1. Shale gas extraction

The reason for the jump in the development of shale production was the desire of the United States to become a fuel-independent country. It was in this country that the "shale revolution" was triggered by favorable circumstances that are not easily replicated elsewhere:

− Workable geological conditions, facilitating hydraulic fracturing;
− Tax incentives;
− Existing pipeline infrastructure;
− Private property rights that stimulated drilling and investment [6].

It is possible to determine the main consequences of the growth of the USA shale industry. By developing domestic production of shale gas, the United States receives significant benefits that go far beyond the purely energy aspect of meeting the current demand for energy resources. The development of shale gas creates a certain impetus for the development of the economy and an increase in the number of jobs in the country. Thanks to the “shale revolution”, a long downward trend in employment dynamics in the USA oil and gas sector was replaced by a recovery – employment here

increased by 62 % compared with 2003 levels. No less important is the positive effect of long-term maintenance of low domestic gas prices against the backdrop of an excess supply. Used to produce a wide range of industrial products, relatively cheaper gas creates a competitive advantage for American products. Thus, the average gas price for industry in 2012 amounted to $136.6/thousand cubic meters. Cube m, a decrease of 60 % compared to 2008. In addition, low gas prices contribute to a reduction in electricity prices, which has a positive effect on the consumer sector. According to analysts' forecasts, current electricity prices would be about 10 % higher if there were not such a sharp increase in shale gas production. Also, low gas and electricity prices will to some extent favor the process of the USA industrial growth due to territorial reorientation and increasing the country's export potential. Against this background, by 2035, due to lower gas prices, an additional increase in industrial production by 4.7 % is expected. The advantage of shale gas production, in contrast to the largest conventional deposits, is also proximity to consumption centers [7].

Statistics say that the Americans have a fairly impressive number of shale deposits, among which it is worth highlighting the largest known accumulation of shale gas in the world – the Marcellus field. It is a huge 8 to 80 m thick shale stratum that stretches from New York State in the northeast to Tennessee in the southwest. Its initial geological resources are estimated at 42.5 trillion m3, the area is 246 thousand km2, and the thickness is on average about 50 m (in some places up to 350 m or more). The main deposits are located in low-porosity (2-5 %), low-permeability Middle Devonian shale deposits at depths of 300 to 2000 m (980 to 6500 ft) below sea level. The reason for the leadership of Marcellus in production volumes is the economic efficiency of its development, due to relatively low costs and proximity to consumers of the extracted raw materials. Production costs are constantly decreasing and the reserves for their reduction are far from being exhausted [8].

Transformations in the USA energy market have led to a number of consequences. The United States is turning from the world's largest consumer and importer of energy resources into a self-sufficient power in the energy sense and is already beginning to directly or indirectly influence the world energy markets. Investments in this industry are seriously strengthening the role of the United States in the global gas market.

In general, the "shale revolution" has become a vivid manifestation of a more general phenomenon – the world has entered an era of widespread development of technologically complex energy resources.

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TARIFF FORMATION OF ELECTRICITY USED IN RUSSIA

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Abstract. This article is devoted to the consideration of tariff rates for electricity and their cost. This article also examines the question of what constitutes the tariff rate for electricity, possible ways to reduce the cost of electricity and whether it is possible to switch from one tariff rate to another.

Keywords: electricity, tariff, cost, one-rate tariff, two-rate tariff, differentiated tariff, services, resource.

ТАРИФООБРАЗОВАНИЕ ЭЛЕКТРОЭНЕРГИИ, ИСПОЛЬЗУЕМОЕ В РОССИИ

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Аннотация. Данная статья посвящена рассмотрению тарифных ставок на электроэнергию и их стоимость. Также в статье отражаен вопрос, из чего складывается тарифная ставка на электроэнергию, возможные пути снижения стоимости электоэнергии и можно ли перейти с одной тарифной ставки на другую.

Ключевые слова: электроэнергия, тариф, стоимость, одноставочный тариф, двухставочный тариф, диффенцированный тариф, услуги, ресурс.

Payment of housing and communal services is an important and integral part of every citizen of the Russian Federation. One of the criteria included in the payment for housing and communal services is the payment of electricity. As you know, electricity payments in our country can be carried out at several rates and depend on a number of factors.

As a rule, consumers of electric energy (except for the population, agricultural consumers and resellers) are divided into two groups [1]:

Group 1 – industrial and equivalent consumers with an attached capacity of 750 kV·A and above, when calculating with which the fee is charged at a two-part tariff;

Group 2 – all other consumers whose electricity is calculated at a single-rate tariff. Let's consider what types of electricity tariffs are in effect in Russia today for each of the groups and whether it is possible to switch from one tariff rate to another. According to the Federal Law of the Russian Federation No. 35-FZ of 26.03.2003 "On Electric Power Industry", the tariff is a system of price rates at which electricity is calculated. Below are a number of criteria that make up the electricity tariff:

1) the price of electricity production;
2) the price of services for the transfer and distribution of the resource;
3) sales allowance (required for the operation of an energy sales company);
4) infrastructure payments.

It is important to note that more than 60 % of the cost of the tariff rate is for the purchase of an energy resource [2]. Based on this, it can be noted that the price of the tariff rate has become higher for 2022. The table below shows an example of the tariff rate for 2021 and 2022 in the Orenburg region [3; 4].

Table 1 – Comparative table of the price (tariff) for electric energy for the population and equivalent categories of consumers in the Orenburg region for 2021 and 2022

Indicator (consumer groups broken down by rates and differentiated by zones of the day)	Unit of measurement	2021 year		2022 year	
		from 1.01.2021 to 30.06.2021	from 01.07.2021 to 31.12.2021	from 1.01.2022 to 30.06.2022	from 01.07.2022 to 31.12.2022
Single-rate tariff	rub/k·Wh	3,19	3,30	3,30	3,46
Single-rate tariff, differentiated by two zones of the day					
Daytime zone (peak or semi-peak)	rub/k·Wh	3,67	3,80	3,80	3,98
Night zone	rub/k·Wh	2,29	2,37	2,37	2,48
Single-rate tariff, differentiated by three zones of the day					
Peak zone	rub/k·Wh	4,14	4,28	4,28	4,49
Semi-peak zone	rub/k·Wh	3,19	3,30	3,30	3,46
Night zone	rub/k·Wh	2,29	2,37	2,37	2,48

Based on the data obtained, we can conclude that the tariff rate for electricity from the period of the second half of 2021 to the second half of 2022 increased by 4,84 %.

It is also necessary to take into account the costs of transporting the resource, which, most often, amount to more than 50 % of the cost of the resource itself.

In the last place is the compensation of the costs of sales companies. As a rule, such costs amount to no more than 1 % of the final amount reaching the consumer [5].

It should be noted that the calculation of the tariff for light is carried out in accordance with the rules established by the Decree of the Government of the Russian Federation dated 06.05.2011 No. 354 "On the provision of utilities to owners and users of premises in apartment buildings and residential buildings".

By agreement between consumers and the energy supply organization, both single-rate and double-rate tariffs can be applied, determined by the parties within the established level of the single-rate tariff.

To begin with, let's consider a one-rate tariff. A single–rate tariff (single tariff) is a tariff used in calculating the amount of payments for lighting various premises, as well as other needs not related to production. It is taken at the rate of 1 kWh of energy consumed. In other words, this is a tariff, the price of which does not change throughout the day. Most likely, such a tariff is used in most cases by consumers (urban and rural population) [1].

If we talk about a two-part tariff, then it is necessary to understand that it provides for the presence of two indicators, variable and constant. The variable indicator includes the offer price and the cost of electricity transmission services via electric networks. A permanent one is a fixed payment for electricity. A one- and two-part tariff for electricity is applied at the consumer's choice.

But there is also a third type of tariff, called differentiated. Such a tariff is understood as charging different amounts for electricity consumption depending on the time of day. Thus, the tariff rate is divided into several parts (zones), namely, daytime (from 7:00 to 23:00) and night (from 23:00 to 7:00). In order to consume electricity at this tariff, it is necessary to install two-zone (two-tariff) or three-zone (three-tariff) electricity meters [1].

It is necessary to take into account the fact that the cost of electricity in rural areas is much lower than for consumers living in urban areas. Table 2 shows the readings of the cost of electricity in rural and urban areas in the Orenburg region for 2022 [4].

Table 2 – Comparative table of the price (tariff) for electric energy for consumers living in urban and rural settlements in the Orenburg region for 2022

Indicator (consumer groups broken down by rates and differentiated by zones of the day)	Единицы измерения	Urban area		Rural area	
		from 1.01.2022 to 30.06.2022	from 01.07.2022 to 31.12.2022	from 1.01.2022 to 30.06.2022	from 01.07.2022 to 31.12.2022
Single-rate tariff	rub/k·Wh	3,30	3,46	2,31	2,42
Single-rate tariff, differentiated by two zones of the day					
Daytime zone (peak or semi-peak)	rub/k·Wh	3,80	3,98	2,66	2,78
Night zone	rub/k·Wh	2,37	2,48	1,68	1,76
Single-rate tariff, differentiated by three zones of the day					
Peak zone	rub/k·Wh	4,28	4,49	2,99	3,13
Semi-peak zone	rub/k·Wh	3,30	3,46	2,31	2,42
Night zone	rub/k·Wh	2,37	2,48	1,68	1,76

Analyzing the table presented above, we conclude that the tariff rate for electricity for residents of rural settlements is 43 % lower compared to the tariff rate for consumers living in urban settlements.

There are also benefits for paying for electricity. Many residents of private homes are faced with the termination of gas supplies, and therefore it is necessary to replace this resource with electricity. As a result, the amounts in payments for housing and communal services also increase significantly.

There is a benefit for this category of the population, thanks to which it is possible to reduce the electricity tariff. In accordance with the norms of Russian legislation, a reduction coefficient of 0.7 is used for residents of non-gasified private houses.

So how do you change the tariff and pay less for electricity? Each consumer has the right to independently decide which price will be more profitable for him, it is enough to write an application to an energy sales company about changing the meter. However, before doing this, it is necessary to analyze the situation and consider all ways to solve this problem. To do this, you need to determine at what time the greatest electricity consumption occurs, and calculate whether the tariff change will bring positive changes in your budget. Also, saving electricity consumption by using a single-tariff rate differentiated by different zones, remember that it is necessary to install an appropriate electricity meter, the cost of which is several times higher than the cost of a conventional single-tariff digital or induction meter and calculate the approximate payback time. You can switch to a different electricity tariff at any time on the initiative of the utility payer.

Despite the fact that utility tariffs are increasing from year to year, this does not cancel the obligation of citizens of the Russian Federation to pay for utilities. Due to the appearance of a large amount of equipment and the lack of gas in many residential premises, the issue of the cost of electricity is gaining more and more urgency. The price of this resource depends on many factors, which is why there are several tariffs for light. To understand the principles of their formation, it is necessary to understand what is included in the electricity tariff for the population.

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REASONS OF THE PROBLEM OF PRESERVATION OF BIOLOGICAL DIVERSITY OF SPECIES AND WAYS OF SOLVING IT

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Abstract. This article analyzes the current world problems related to the preservation of biological diversity of species, lays out the preconditions that led to these issues and gives examples. Additionally, the main reason for the extinction of species on the territory of Russia is identified, and possible methods for preserving biological diversity are described.

Keywords: biodiversity, biodiversity, organism, habitat, climate, exotic species, extinction, biological resources, poaching, fragmentation, international agreement, reserve, corridor, gene bank

ПРИЧИНЫ ВОЗНИКНОВЕНИЯ ПРОБЛЕМЫ СОХРАНЕНИЯ БИОЛОГИЧЕСКОГО РАЗНООБРАЗИЯ ВИДОВ И СПОСОБЫ ЕЕ РЕШЕНИЯ

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Аннотация. В статье анализируются существующие мировые проблемы сохранения биологического разнообразия организмов, приводятся предпосылки возникновения данных проблем и примеры. Помимо этого, указывается основная причина исчезновения видов на территории России, а также описываются возможные способы сохранения биологического разнообразия.

Ключевые слова: биологическое разнообразие, организмы, место обитания, климат, экзотический вид, исчезновение, биологические ресурсы, браконьерство, фрагментация, международное соглашение, заповедник, коридор, генетический банк.

We are surrounded by a vast variety of living beings, including plants, animals, microorganisms, forming various combinations across our planet. Both the species themselves and their complexes, or biocenoses, first appeared long before humans

originated as a biological species. Each epoch in the history of Earth brought about a greater and greater change to this world. The first primitive groups of organisms were replaced by new, more morphophysiologically advanced groups with greater evolutionary capacities, and this has been going on as long as life has existed on Earth. All this is the result of organic evolution, often known as biodiversity.

The term “biodiversity” refers to the totality and variety of life on the planet. It describes the degree of variation of life. The concept of biodiversity includes all microorganisms, plants, animals, and ecosystems such as coral reefs, forests, rain forests, deserts, and so on. The term indicates the wealth of biological resources available to us. It must be taken into account in order to preserve a natural community of plants, animals and other living things [1]. Over the last three decades, not only biologists, but also economists, politicians, and the general public have started to pay attention to biodiversity due to the obvious threat of anthropogenic degradation of biodiversity, which exceeds normal, natural degradation.

According to the UNEP Global Biodiversity Assessment (1995), over 30,000 animal and plant species are threatened with extinction. 484 animal species and 654 plant species have disappeared in the last 400 years. The International Union for the Conservation of Nature (IUCN) estimates that about a third of all known species in the world are threatened with extinction and 25 % of all mammals will become extinct within 20 years [2].

The following reasons of the accelerated the biodiversity’s decline:

1. Habitat destruction is the most common cause of the decline in biodiversity. The loss of habitats is associated not only with the direct destruction of habitats, but also with their pollution and fragmentation, i. e. the division of the total area of habitat into several parts [3].

2. Global climate change. Due to climate change the populations of reindeer, arctic foxes, toads, polar bears, penguins, gray wolves, tree swallows, painted turtles and salmonids are under threat. To date, the theory that greenhouse gas emissions, primarily CO2 from industry, are the main cause of global warming has dominated the world, with 97 % of publications on climate change supporting the theory that global warming is due to greenhouse gas emissions [4].

3. Overexploitation of biological resources. Earthquakes, floods and droughts are examples of ecosystem destruction due to overexploitation of biological resources. For example, one of the main resources of the state of Bangladesh is timber. This undeveloped country makes money by exporting it to America and Europe. Deforestation has caused rivers in this country to overflow their banks more often, seriously harming the ecosystem. Humans can profoundly affect processes hidden deep underground by extracting oil from the ground and pumping in water with pollutants denser than oil. Therefore, underground shocks are more frequent in the areas of oil and gas production. It is sufficient to note that earthquakes are frequent in Tatarstan, where oil production has been going on for a long time. Construction of water reservoirs is no less dangerous. Huge masses of water, purposely gathered by man in one place, press upon the earth's solidity, forcing the underground layers to shift. As a result of these movements, earthquakes occur in areas of large artificial lakes. In some

cases, such as the Cremasta Reservoirs in Greece or Koin in India, these man-made earthquakes have had catastrophic consequences [5].

4. Invasion of exotic species refers to the infilling of a habitat with other organisms not previously existing in the given conditions leads to significant changes in the composition, structure and processes of the ecosystem as a whole, which threaten the native species. The most striking example is the “Australian Tragedy”, associated with the introduction of rabbits to the continent in 1788. The introduction of a previously uncommon species by 1900 in Australia had caused the death of several species of kangaroos and harmed small marsupials and plants. Another example is the “Galapagos disaster”, when goats were imported to the islands in 1959 and many local organisms were already in danger of going extinct due to a shortage of food by the 1970s [6].

5. Poaching is the main reason of the rapid extinction of species in Russia, including by our closest neighbors. Poachers have almost completely exterminated the Ussuri tiger. Its skin and body parts are used in Chinese traditional medicine. Their pelts are very expensive, so despite the threat of harsh punishment tigers are still being exterminated, though lately it has become more difficult. There are no more than 400 of them left. According to the Ministry of Natural Resources for 2019, poachers have killed about 4.5 thousand animals, primarily elk, roe deer and wild boar. Species such as the Mauritian dodo, quagga, moa, Steller's cow, auroch, marsupial wolf, orange toad, Chinese river dolphin, Turanian tiger, Syrian coulang, blue antelope, carolina parrot and many others have been exterminated due to poaching [7].

The study of biodiversity has moved from the field of purely scientific interests to the field of necessary practical actions. Many biologists have shown that the functioning and the very stability of the biosphere, in which human life takes place, depend on the perfection of the regulation of the processes occurring in the biosphere. And this can only be accomplished through diversity. Therefore, the conservation of biodiversity is one of the world's most urgent issues. The realization of this conclusion led to the signing of the Convention on Biological Diversity and the development of the European Strategy on Biological and Landscape Diversity. Additionally, normative regulation of the use of natural resources, education of a humane and rational attitude to nature will help in solving the problem of depletion of the diversity of life on our planet and preserving its uniqueness.

Currently, the main methods for biodiversity conservation are:

The establishment of protected areas – protected habitats that contain healthy intact biological communities is the most effective way to preserve full biodiversity. We might even consider it the only way to conserve species, because the resources and knowledge we have are only sufficient to save a small fraction of the world's wildlife in captivity. In addition, protected areas are created by traditional organizations concerned with preserving national culture. National governments have recognized the land rights of such traditional societies in many countries, including the United States, Canada, Brazil, and Malaysia.

International agreements-at the international level, habitat conventions, focusing on those features of ecosystems in need of protection, complement species

conservation conventions, such as CITES. Within these habitats, many individual species can come under protection. The most important of these are three conventions: The Convention on Wetlands of International Importance Especially as Waterfowl Habitat, also known as the Ramsar Convention on Wetlands, the World Heritage Convention, and the UNESCO Biosphere Reserves Program [8, p. 93-99].

Habitat corridors in habitat – it is clear that corridors are needed along known migration routes. One interesting approach to managing a system of nature reserves is to combine isolated protected areas into one larger system using corridors representing strips of protected areas between reserves. Such corridors, also known as conservation corridors or movement corridors, can allow plants and animals to disperse from one area to another, facilitating gene exchange and colonization of suitable areas. Corridors also help protect animals that migrate seasonally between separate territories in search of food. By restricting movement, it is possible to starve them [9, p. 89-91].

Minimizing edge effects and fragmentation. There are strategies for combining small nature reserves and other protected areas into larger reserves. Nature reserves are often part of a larger managed area with controlled extraction of natural resources such as timber in forests, livestock grazing, and farming. If biodiversity protection is seen as a secondary priority in area management, then larger areas can be included in management plans, and the larger areas are involved in conservation plans, the stronger the fragmentation effect is reduced. If possible, an entire ecosystem (a river basin, a lake, a mountainous area) should be included in the protected area, because it is the ecosystem that is most convenient for management [10, p. 36-39].

Planting trees. This method will not only recreate habitats for various animals and plants, but will also serve as a method to combat climate change In 2019, employees at the Swiss Federal Institute of Technology Zurich announced that there is enough room on our planet to plant a forest of 900 million hectares. If this idea becomes a reality, such a forest would be as big as a full continent and could neutralize the 205 billion tons of carbon dioxide produced by humanity, which contributes to the global rise in air temperature. But the researchers emphasized that along with planting a forest, people would have to reduce the amount of greenhouse gases emitted into the air, otherwise the trees grown would be of little use [11].

Creating gene banks - Gene banks store plant seeds, frozen tissue cultures and germ cells (more often frozen sperm is stored) from which animals or plants can be obtained. Banks of frozen cells of endangered animal species have been established in a number of research centers around the world. Tissue culture is used to preserve those plant species whose seeds do not have a dormancy period and therefore quickly lose germination. As a rule, the seeds of cultivated plants are preserved in jars. There are more than 50 such seed banks in the world. The largest gene bank is located in Norway in the permafrost zone [12].

Humanity creates the illusion that we could somehow do without biodiversity or that it is of secondary importance to our modern world, but the reality is that with eight billion people on the planet today and an expected nine billion by 2050, biodiversity is more important than ever. The third edition of the Global Biodiversity Outlook provides sobering facts and figures and outlines the key reasons why the challenges of

conserving and, indeed, expanding biodiversity remain unaddressed. One crucial area is economics. The great significance of the variety of living things and their contribution to the health and functioning of ecosystems, including soils, oceans, freshwater systems, and even the atmosphere, is still not recognized in the majority of economies.

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SOCIAL ADVERTISING IN RUSSIA, SPAIN AND THE UK: COMMON AND DISTINCTIVE FEATURES

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Abstract. The article is devoted to the study of social advertising in Russia, Spain and the UK. It is noted that there are differences in the legislative framework, the degree of development of the industry and thematic representation of social advertising in the countries analysed. The common and distinctive features of social advertising in Russia and abroad are singled out.

Keywords: social advertising, the Russian Federation, Great Britain, Spain, Russian social advertising, foreign social advertising.

СОЦИАЛЬНАЯ РЕКЛАМА В РОССИИ, ИСПАНИИ И ВЕЛИКОБРИТАНИИ: ОБЩИЕ И ОТЛИЧИТЕЛЬНЫЕ ЧЕРТЫ

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Аннотация. Статья посвящена исследованию социальной рекламы в России, Испании и Великобритании. Отмечено, что существуют различия в законодательной базе, степени развития индустрии и тематической представленности социальной рекламы в анализируемых странах. Выделены общие и отличительные черты социальной рекламы в России и за рубежом.

Ключевые слова: социальная реклама, Российская Федерация, Великобритания, Испания, российская социальная реклама, зарубежная социальная реклама.

As it is known, the study of social advertising is relevant in connection with the focus on socially significant problems. In addition, comparative studies are of particular importance, since they give the opportunity to determine the common and distinctive features of the phenomenon under study in different countries. It helps to trace important trends, problems, prospects for the development of social advertising in domestic realities.

The main components of social advertising are the real concerns of society and motivation, including ways to influence people. Among the significant social problems covered in this type of advertising, there may be problems of drinking alcoholic

beverages, smoking, prevention of emergencies, domestic violence, protection of rights, etc. [1].

Distinctive features of social advertising from other types of advertising are compliance with the interests of the state, consideration of important problems, promotion of positively oriented values and attitudes, reaching a large audience [2, p. 59].

When comparing social advertising in different countries, it is important to investigate its terminology. This is associated with the fact that there are differences in the interpretation of the term “social advertising”.

In domestic science, the term “social advertising” is used to focus on what is the object of promotion in an advertising proposal. Western countries, in turn, are distinguished by the internal differentiation of the term “social advertising” into “non-commercial advertising” and “public advertising” [3, p. 19].

The specificity of non-commercial advertising is that it is sponsored by representatives of non-commercial institutions; it represents their interests in order to increase the amount of donations, to choose a certain candidate during election, or draw attention to significant social problems. The purpose of public advertising is to promote certain positive projects. Its development is carried out by experts on a free basis [4, p. 254].

In the Russian interpretation of social advertising, two concepts distinguished abroad are combined. So, according to the federal law “On Advertising” dated March 13, 2006 №38-FL (as amended on March 8, 2015), it states that social advertising is “information distributed in any way, in any form and using any means, addressed to an indefinite circle of persons and aimed at achieving charitable and other socially useful goals, as well as ensuring the interests of the state” [5].

Despite the fact that the law of the Russian Federation “On Advertising” contains a definition of social advertising, as well as a description of the areas of its application, at the moment there is a lack of regulation of this type of advertising [6, p. 156]. However, in 2014, the State Duma adopted a legislative initiative for consideration, according to which the TV channel should devote 10 % of its advertising time to commercials highlighting social problems. Despite the fact, this legislative initiative was not supported by the majority, and further trends in improving the legislative framework of Russia in relation to social advertising are not yet fully seen. Nevertheless, the initiative to increase the number of social advertising, taking into account the state interest, has a positive effect on modern society [3, p. 19].

In the UK, social advertising is not subject to legal control. Consequently, the authorities cannot impose an obligation on the media in the form of publishing an advertising message on a free basis. Thus, the corporation “BBC” included a separate clause in the charter on the placement of social advertising [7, p. 50]

Unlike Russia, in Spain the creation of social advertising has become an industry that has clear criteria and strict control. In Spain, the Advertising Law was passed in 1988. Spanish social advertising can be placed at the initiative of the state, commercial and non-profit organizations.

Nevertheless, most often it is commercial, non-profit and charitable organizations that act as sponsors, since it is focused more on resolving socially significant issues, rather than state or political contradictions [8].

Summarizing the data available, the author of the article, Kashapova E., highlights the common and distinctive features of social advertising in Russia and abroad. Among the similarities mentioned are the following ones:

– thematic focus of social advertising on overcoming crisis situations;
– relevance of social problems common to the population of different countries: family relationships, addiction to drugs or alcohol, environmental problems, etc.;
– functioning of a number of foundations and organizations involved in charity;
– subjects of social advertising are representatives of commercial and non-profit organizations and public authorities;
– homogeneity of participants in social advertising;
– similarity of the goals of creating and placing social advertising;
– domestic advertising distribution channels are similar to foreign ones;
– presence of bodies involved in the regulation of advertising activities [9].

Among the distinctive features of social advertising in Russia and abroad Kashapova E. highlights the following ones:

– appearance of social advertising in foreign countries long before Russia;
– the difference in thematic focus: if in Soviet times in Russia advertising was aimed at strengthening the authority of the state and promoting ideological attitudes, then abroad – at a person as a citizen or participant in a problem situation;
– shocking social advertising is often used in foreign countries, which is not typical for domestic realities;
– sponsors of social advertising in the UK are government representatives, which is not observed in Russia, as well as in Spain;
– social advertising tools are used mainly by commercial corporations, which is more typical for foreign countries;
– frequent engagement of celebrities to participate in foreign social advertising. In Russia, only a few of them take part in these projects;
– emphasis of domestic social advertising on solving problems that have arisen, rather than on their prevention; the monotony of ways to deal with them by providing financial resources;
– shortage of advertising time for the distribution of social advertising in Russia;
– problems of providing high-quality and creative design of domestic social advertising;
– compliance with the legislative framework, in particular the Federal Law “On Advertising”, while there are no such restrictions in many countries, except Spain [9].

It is also important to determine the ratio of significant topics covered in social advertising of the countries we are comparing – Russia, Spain and the UK.

Thus, the paper demonstrates that the most essential issues covered in social advertising of Russia include the following ones:

– the problem of drug addiction;

– alcoholism;
– the spread of AIDS;
– crime level;
– ecological problem;
– protection of human rights;
– patriotism;
– nationalism [10, p. 143].

According to the research, the most frequently mentioned problems in Spanish social advertising are: “1) smoking, alcoholism, drug addiction (36 %); 2) protection of the environment and animals (26 %); 3) domestic violence (17 %); 4) diseases (AIDS, childhood cancer, disability) (9 %); 5) the behaviour of motorists on the roads (5 %); 6) racism (3 %); 7) social life (2 %); 8) noise (acoustic) pollution (2 %)” [11, p. 2].

Among the most significant topics that are typical for social advertising in the UK, the following ones stand out:
1) driving in a sober state, ensuring safety on the road and in public transport;
2) drinking alcoholic beverages, smoking, STD prevention;
3) compliance with fire safety rules;
4) domestic violence;
5) problems of raising a modern child;
6) promotion of a healthy lifestyle and a balanced diet;
7) the responsibility of the citizens of the country;
8) environmental problem;
9) Internet environment;
10) dissatisfaction with the standard of living [0, p. 40-41].

Thus, a comparative study of social advertising in Russia, Spain and the UK showed that the development of this type of advertising in our country is promising. Both in Russia and in Spain, the legislation provides for a description of advertising activities. At the same time, the UK is deprived of control at the state level. One of the most common significant and often mentioned topics covered in the social advertising of the three countries are the problems of drug addiction, alcoholism and smoking, violence and environmental problems.

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ENVIRONMENTAL IMPACT OF THE AGRICULTURAL STRATEGY OF THE RUSSIAN FEDERATION FOR THE PERIOD UP TO 2030

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Abstract. In this study an attempt was made to assess the factors of impact on the environment, adopted Strategy of development of agro-industrial and fishery complex of the Russian Federation for the period up to 2030 (approved by Decree of the Government of the Russian Federation from 12.04.2020 N 993-p). The analysis highlighted the main negative consequences of the development of the agro-industrial complex (AIC), and on the solution of which the further growth of agricultural productivity will depend.

Keywords: agriculture, agro-industrial complex (AIC), negative impacts, environment.

ЭКОЛОГИЧЕСКИЕ ПОСЛЕДСТВИЯ СЕЛЬСКОХОЗЯЙСТВЕННОЙ СТРАТЕГИИ РФ НА ПЕРИОД ДО 2030 ГОДА

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Аннотация. В данном исследовании была сделана попытка оценить факторы воздействия на окружающую среду принятой Стратегии развития агропромышленного и рыбохозяйственного комплексов Российской Федерации на период до 2030 года (утверждена Распоряжением Правительства РФ от 12.04.2020 № 993-р). В ходе анализа были выделены основные негативные последствия развития агропромышленного комплекса (АПК), от решения которых будет зависеть дальнейший рост производительности сельского хозяйства.

Ключевые слова: сельское хозяйство, агропромышленный комплекс (АПК), негативные воздействия, окружающая среда.

At present, the growth rate of agricultural production in the Russian Federation is only increasing every year. Because of this agro-industrial complex (AIC) is becoming one of the main drivers of the domestic economy, but at the same time there are a number of problems that must be solved in order to continue the growth of production. We can distinguish the main problems: 1. backwardness in scientific and technological development; 2. shortage of agricultural machinery; 3. degradation of irrigated lands; 4. slow growth in the amount of fertilizers used in agriculture. The strategy for the development of the agro-industrial and fishery complex of the Russian Federation for the period up to 2030, presented by the Government of the Russian Federation in 2020 [1], implies the solution of these problems.

The implementation of this strategy [1] will achieve a significant increase in productivity in the agro-industrial complex, but it is accompanied by a significant negative impact on the environment, which is manifested in the increase in land taken for the needs of the agro-industrial complex; the use of new types of fertilizers and agrochemicals; an increase in water production; increased production and use of agricultural machinery and equipment; improved genetic potential in cattle breeding, etc. The paper will consider in more detail: the increase in land taken for the needs of the agro-industrial complex; the use of new types of fertilizers and agrochemicals and the increase in the production and use of agricultural machinery and equipment.

Figure 1 shows the dynamics of cultivated areas in Russian Federation during 20 years, where we can see that in the last 10 years there is an increase of land used in agriculture. At present the area is 80 million hectares. It is planned to increase the area of agricultural land use up to 50 million hectares through drainage and irrigation of unused areas.

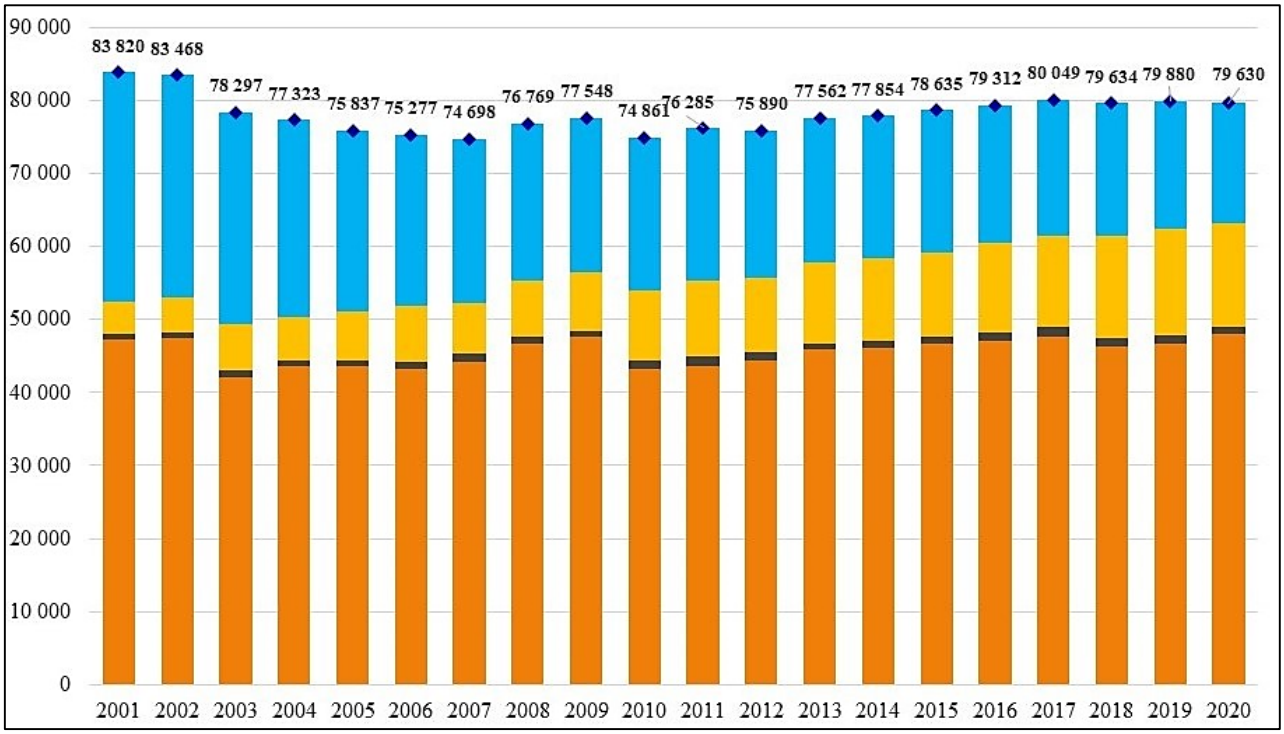


Figure 1. Dynamics of sown areas of crops by groups in 2001-2020, thousand hectares [2]

Such a decision could have a negative impact on the ecosystem of some regions, as well as lead to the destruction of the habitats of various species of living organisms, leading to the extinction of some species. In turn, this will provoke disruption of the food chain, which will either cause the entire chain to disappear or cause animals to migrate from the area, which will make such an area desolate. All these factors will adversely affect the fertility of the land (negatively affect soil formation processes, soil genesis and soil processes) and reduce agricultural productivity.

Another of the tasks prescribed in the strategy is the use of new types of fertilizers and agrochemicals. At present Russia lags behind many developed and the largest developing countries in the level of chemicalization of agriculture. Table 1 shows how Finland and Great Britain, which are also in an unfavorable climatic zone, get many times higher yields of grain crops than Russia only through sufficient use of fertilizers.

Table 1 − Fertilizer application (B, kg/ha a.d.) and yield (Y, c/ha) of grain crops in some countries [3]

Country	*Years*											
	1960		*1980*		*1986-1989*		*1990*		*2000*		*2004-2015*	
	B	*Y*	*B*	*Y*	*B*	*Y*	*B*	*Y*	*B*	*Y*	*B*	*Y*
Russia	7	10,7	68	12,9	99	15,9	90	18,5	20	15,6	26-42	21,5-24
Germany	281	31,7	480	44,3	427	53,9	411	56,7	400	63,8	391	74,7
Great Britain	179	31,1	319	49,1	359	56,7	348	59,2	353	69,7	386	76,6
France	96	24,8	309	48,4	-	-	312	61	318	71	315	74
Hungary	29	19,6	262	47,3	-	-	246	44,1	270	46	285	49,5
USA	42	24,4	113	37,5	-	-	106	47,1	110	58	121	67,8
Finland	1	21,1	190	27,6	-	-	227	35,4	231	38,0	224	39,7

The last 20 years in Russia was a period of intensive farming, which without proper fertilizer supply led to land degradation, wear and tear of reclamation systems, loss of humus – its content in the soil decreased by 20 % on average [4]. In this regard, the Russian government plans to increase the consumption of mineral fertilizers to 80-100 kg/ha. It should be noted that the use of low-quality high ballast species is not taken into account. Increased use of fertilizers can have a negative impact on the environment due to the toxic impurities in mineral fertilizers, among which the most dangerous are halogens, radionuclides, etc., which are directly pollutants. And also the negative impact can occur as a result of the physical and chemical properties of mineral fertilizers, which in the soil manifests itself both chemically, physiologically and biologically. At that, reaction of soil solution, direction of processes of synthesis and decomposition of humus compounds, activity of biochemical, microbiological and other processes change [5].

Separately, we would like to mention the widespread use of pesticides, which are used to increase the yield, profitability of agricultural production and increase labor productivity. But their use has serious negative consequences: 1) death of wild animals in the treatment of fields with pesticides; 2) mass reproduction of pests after the use of pesticides, because not only harmful insects, but also predatory animals are destroyed after treatment; 3) appearance of pests resistant to pesticides; 4) even in small doses they act on the nervous, endocrine, sexual and other human systems.

The Russian agro-industrial complex has an acute problem of shortage of agricultural machinery and equipment. Figure 2 compares the number of tractors per 1000 hectares of arable land in the world. Russia has only 3 tractors, and Canada, where soil and climatic conditions are similar to Russia, has 16 tractors. All this greatly affects the state of equipment and productivity of the agroindustrial complex.

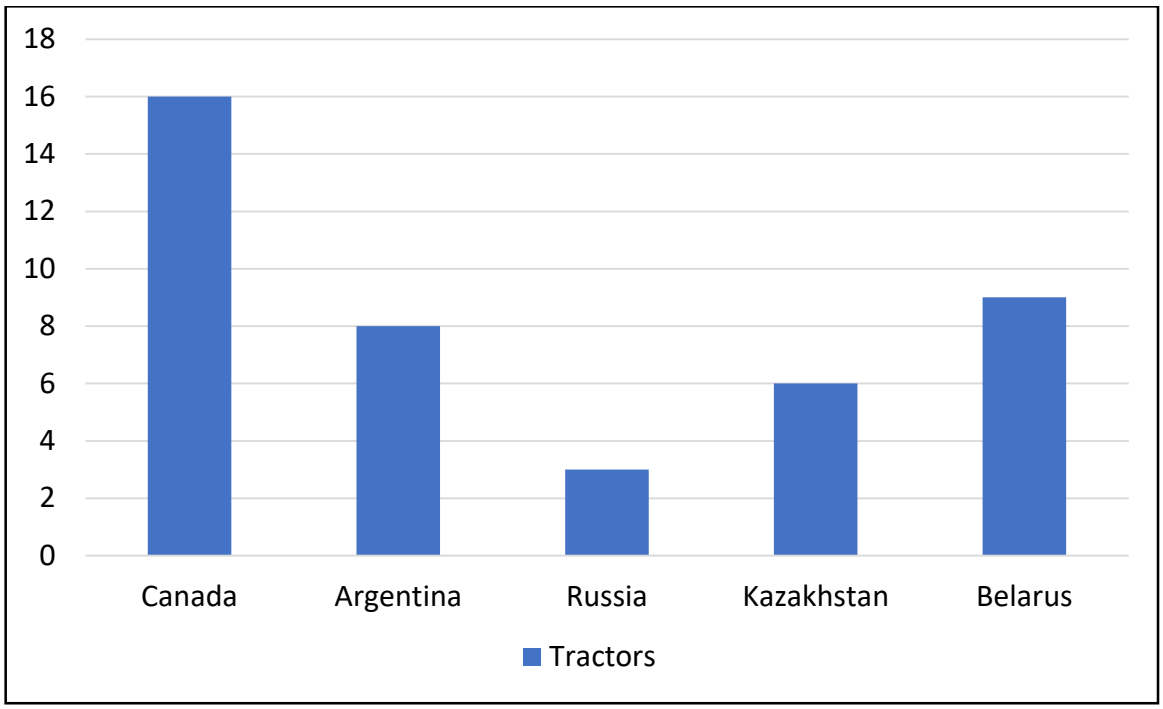


Figure 2. Comparative data on the number of tractors per 1000 hectares of arable land [6]

It is also worth considering agricultural equipment, which has a service life of more than 10 years. Such machinery is not suitable according to modern technological standards, it consumes a large amount of fuel and emits a huge amount of harmful exhaust gases. In order to solve these problems, the government is going to increase the production of machinery and equipment, as well as improve the technical level of manufactured products. But increasing production will have a strong negative impact on the environment: it will increase the extraction of minerals that are needed to produce agricultural machinery; it will require the alienation of certain areas for the construction of production plants, which could lead to changes in the landscape, a decrease in biodiversity and the mass destruction of plants, flora and fauna; and it will

require construction materials (rare metals, fiberglass, cement, etc., the extraction and processing of which produces toxic fumes) [7].

The importance of agricultural development is obvious, it has an important role in the economy. But it is important to remember what harm it can do to the environment. So, any decision needs a separate, comprehensive study.

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УДК 338

MODERN COMPONENTS OF THE ORGANIZATION MANAGEMENT SYSTEM

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Abstract. Digitalization, automation, and virtualization of business processes force managers to fundamentally rethink and radically redesign the main and auxiliary business processes in traditional organizations. For the efficiency of production and economic activity, the managers of the organization are searching for a mechanism for adapting traditional organizations to modified socio-economic systems. New components and elements of the management system that transform the traditional organization under the influence of Industry 4.0 are considered.

Keywords: virtual-material business environment, information and communication technologies, remote management, digital economy.

СОВРЕМЕННЫЕ КОМПОНЕНТЫ СИСТЕМЫ УПРАВЛЕНИЯ ОРГАНИЗАЦИЕЙ

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Аннотация. Цифровизация, автоматизация и виртуализация бизнес-процессов заставляют менеджеров фундаментально переосмыслить и радикально перепроектировать основные и вспомогательные бизнес-процессы в традиционных организациях. Для эффективности производственно-экономической деятельности менеджеры организации занимаются поиском механизма адаптации традиционных организаций к модифицированным социально-экономическим системам. Рассмотрены новые компоненты и элементы системы управления, которые трансформируют традиционную организацию под влиянием Индустрии 4.0.

Ключевые слова: виртуально-материальная бизнес-среда, информационно-коммуникационные технологии, удаленное управление, цифровая экономика.

In modern organizational and managerial and socio-economic conditions, the development of any organization is carried out through the use of new technologies. By new technologies we mean technologies inherent in the Fourth industrial revolution.

Industrial revolutions are commonly understood as a mass transition from one type of labor to another, corresponding to the historical stage of the formation and development of society.

The fourth industrial Revolution combines all the experience, all the knowledge and technologies that have been accumulated over previous periods and opens up huge prospects for society (Figure 1):

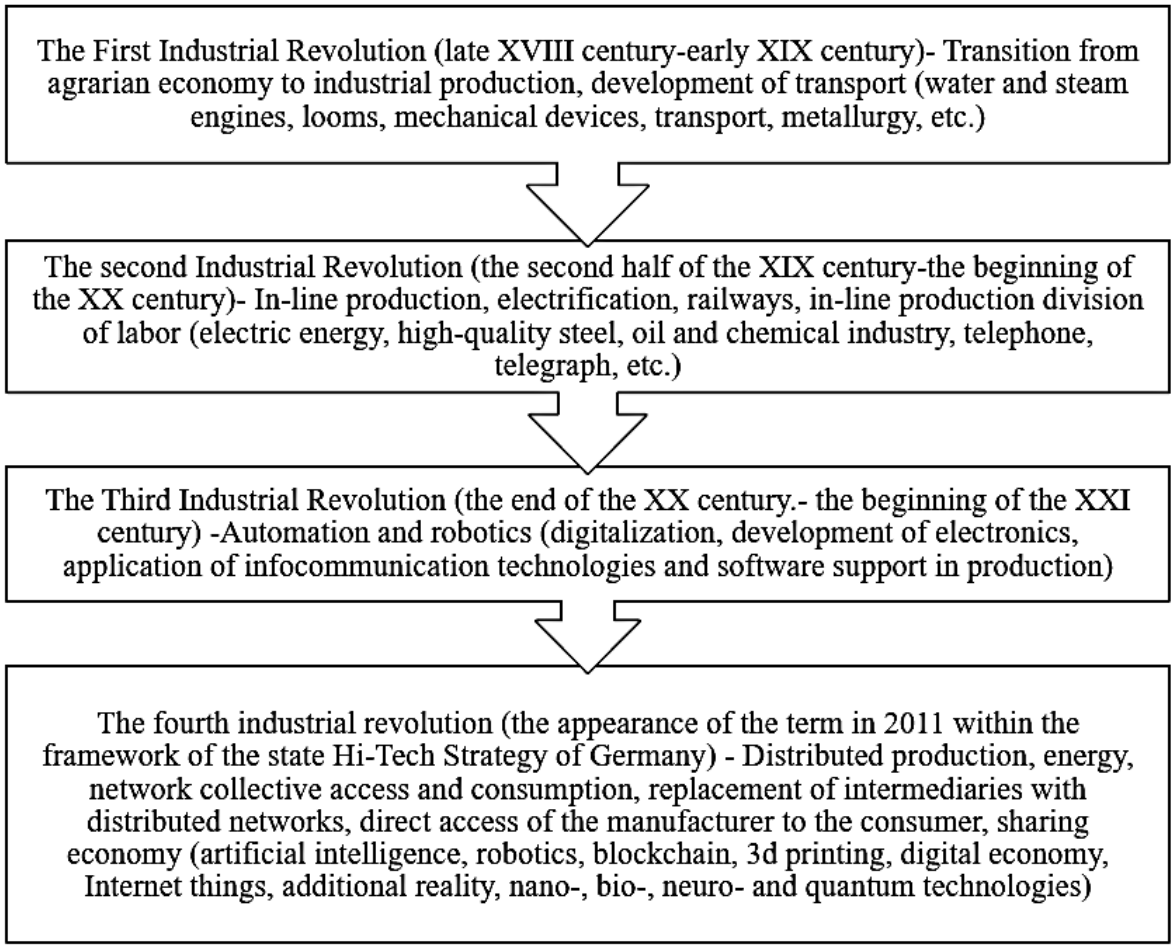


Figure 1. Industrial revolutions [1]

The most promising trend of the quadruple industrial revolution is the digital economy. The digital economy unites almost all the technologies of the fourth industrial revolution, as we have noted in figure 1.

Although the fourth industrial revolution began to gain momentum in 2011, now there is no single and generally accepted concept of the digital economy.

Out of all the diversity of the concept of digital economy, we are close to the understanding of the digital economy formulated by A.V. Keshelava, who believes that the “digital (electronic) economy” is “an economy that exists in a hybrid world, a new reality in which the real and virtual worlds are inextricably linked and all the actions necessary for the real world can be to commit through the virtual world” [2, p. 6].

According to the program “Digital Economy of the Russian Federation” dated 28.07.2017 No. 1632-R [3], the following key digital technologies are distinguished: big data, neurotechnology’s and artificial intelligence, distributed registry systems, quantum technologies, new production technologies, wireless communication technologies, industrial Internet, robotics and sensor components, virtual and additional realities, and others.

In this article, the authors decided to pay special attention to scientific publications aimed at studying the three components of the digital economy we are considering.

Confirmation that the virtual business environment is a component of the digital economy can be found in many works:

I. O. Zharinov asserts that the full life cycle of high-tech products contains the stages of cyber design, cyber production and cyber maintenance, and at the same time business processes and entities influencing these business processes will be located both in a virtual and physical environment [4].

Reshetnikova E. S., Usataya T. V., Kurzaeva L. V. in their work conduct an experiment on the development of AR applications and give a definition of virtual reality. According to these authors: “Virtual Reality (Virtual Reality, VR) is a special three–dimensional environment created by means of three-dimensional modeling, or panoramic photography, which surrounds a person and responds to his actions through special immersive devices – helmets, glasses, suits. Such virtual reality devices recognize gestures, track the positions of human limbs and body, and contain feedback means. At the same time, a person does not see and does not perceive the real world” [5].

Ivanova A. V. in her work analyzes the possibilities and obstacles of virtual and additional reality. The main obstacles highlighted by this author are the high cost of implementation and subsequent operation of solutions, the lack of specialized content, and more. The main benefits highlighted in this paper are acceleration and cheaper learning processes, reduction of errors and acceleration of processes during assembly, repair and operation of special equipment, search for information necessary for parts, the location of goods in stock and much more [6].

These publications allow us to conclude that the virtual business environment is a business environment in which the processes of purposeful interactions of the subject and the object of management take place in three-dimensional space, with the help of devices that seem to erase the temporal and spatial limitations of their joint activities.

The high speed of technological development forms a society of intensive labor in such conditions, caused by the liberalization of the labor market and the integration of production activities into a virtual material environment. Virtualization of the labor market integrates the activities of workers who are disintegrated by geographical and temporal parameters. This integration allows highly qualified teams, for example, participating in project activities, to form unique products and services using information and communication technologies in a virtual material space.

In such an environment, the activities of industrial enterprises involve the implementation of interactions between the subject and the object of management through “remote management”. By remote management, we understand the purposeful impact that is carried out by the subject of management on the object of management in a virtual business environment, using modern information and communication technologies that are components of the digital economy. At the same time, the object of management, as well as the subject of management, can carry out its work with subjects and objects of management, disintegrated by geographical and temporal parameters, self-organizing and participating in telework [7].

Remote management is characterized by a higher level of autonomy and responsibility than in the traditional format of work. At the same time, the management object, performing its official duties remotely from the subjects and objects of management, must follow the generally accepted rules and norms of the organization, be maximally involved in the activities of the organization to achieve its goals [8].

The essence of modern information and communication technologies, which we will consider as one of the components of the digital economy.

The effectiveness of the use of information and communication technologies in industrial enterprises can be determined using an assessment that can be qualified by indicators of the level of turnover of software, technical and organizational support [9].

Modern information and communication technologies can be understood as innovative technologies of Industry 4.0., which are actively introduced into the practical activities of socio-economic systems, erasing the boundaries of traditional forms of communication using cyber-physical systems, allowing you to create, integrate, disintegrate and transmit information in a virtual-material business environment.

Each of the components of the digital economy performs its role in digital management, and their combination provides comprehensive coverage in the organization's activities (Figure 2).

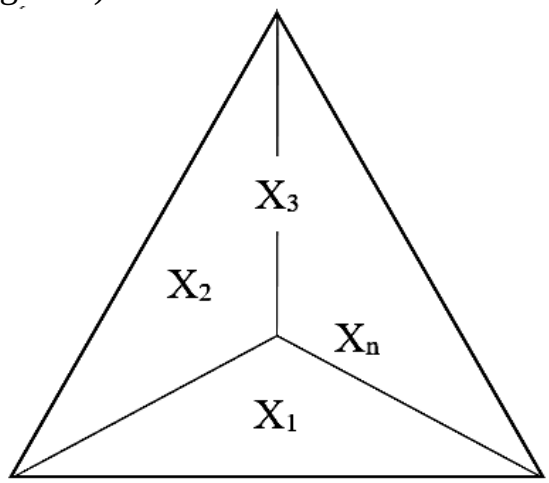


Figure 2. Diagram of the “volume” of author's research on the components of the digital economy

Let us explain the designations indicated in figure 2:

X_1 – virtual-material business environment;

X_2 – Remote control;

X_3 – information and communication technologies;

X_n – many factors of the digital economy.

There is a close relationship and dependence between the virtual and material business environment, information and communication technologies, remote management, and many other components of the digital economy, while they complement and develop each other, forming the competitiveness of organizational and managerial and socio-economic systems.

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УДК 621.3

EVALUATION OF THE EFFECTIVENESS OF AN ACTIVE HARMONIC FILTER IN CONJUNCTION WITH A FREQUENCY CONVERTER

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Abstract. The principle of operation, as well as the design of the active harmonic filter are presented in the article. The effectiveness of the use of a harmonic filter together with a frequency converter in order to reduce losses associated with the presence of higher harmonics in the electric current is considered.

Keywords: filter, higher harmonics, frequency converter, active filter.

ОЦЕНКА ЭФФЕКТИВНОСТИ АКТИВНОГО ФИЛЬТРА ГАРМОНИК СОВМЕСТНО С ЧАСТОТНЫМ ПРЕОБРАЗОВАТЕЛЕМ

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Аннотация. В статье представлены принцип работы, а также конструкция активного фильтра гармоник. Рассмотрена эффективность применения фильтра гармоник совместно с частотным преобразователем с целью уменьшения потерь, связанных с наличием высших гармоник в электрическом токе.

Ключевые слова: фильтр, высшие гармоники, частотный преобразователь, активный фильтр.

The widespread use of non-linear loads, including power electronic equipment – valve converters and frequency control devices for electric drives, saturated transformers and electric motors, powerful electric furnaces and welding equipment – has led to the need to develop and implement systems for correcting the shape of current and voltage curves. Thus, ensuring the quality of electricity and the electromagnetic compatibility of electrical equipment is an urgent problem for St. Petersburg enterprises. The level of power quality has a direct impact on the service life of the main electrical equipment, the stability of the operation of electrical installations, the magnitude of additional energy losses in the elements of power

supply systems and electric motors. In particular, it was found that the value of additional energy losses in electrical machines, due to the presence of higher harmonics of current and voltage, can reach 25 % of the level of total losses. It was also found that in the presence of harmonic distortions in the network that exceed the standards of GOST 32144-2013, the service life of asynchronous motors can be reduced by 1.5-2 times, and capacitor units for reactive power compensation by 5 or more times. For submersible asynchronous electric motors of technological installations with a voltage reduction level of more than 70 % of the nominal value, the critical duration of the voltage dip according to the stability condition is 0.15 s. [1].

One of the promising methods for installing active network filters can serve as a solution to these problems. The idea of active filtration is considered in the works of not only foreign but also Russian scientists. An analysis of these works shows that active filtering is a new and promising direction in the development of semiconductor converter technology that improves the quality of electricity at load nodes [2]. The optimal devices for regulating the parameters that determine the quality of electrical energy are active harmonic filters (AHF). Active filters are switched devices whose parameters are created using a control law. These are adaptive devices, with values that change according to the mode of operation of the network and the characteristics of the load. The most important function of the AHF is the suppression of the higher harmonics of voltage and current. The principle of operation of the AHF is based on the transition of the inductance in accordance with the instantaneous change in the voltage across the load. Consider the efficiency of the AHF together with the frequency converter. AHF is made according to the scheme of a three-phase bridge inverter with a capacitive energy storage (CES) on the DC side with a midpoint, and a T-shaped LCL filter on the AC supply side [3]. The circuit is shown in figure 1.

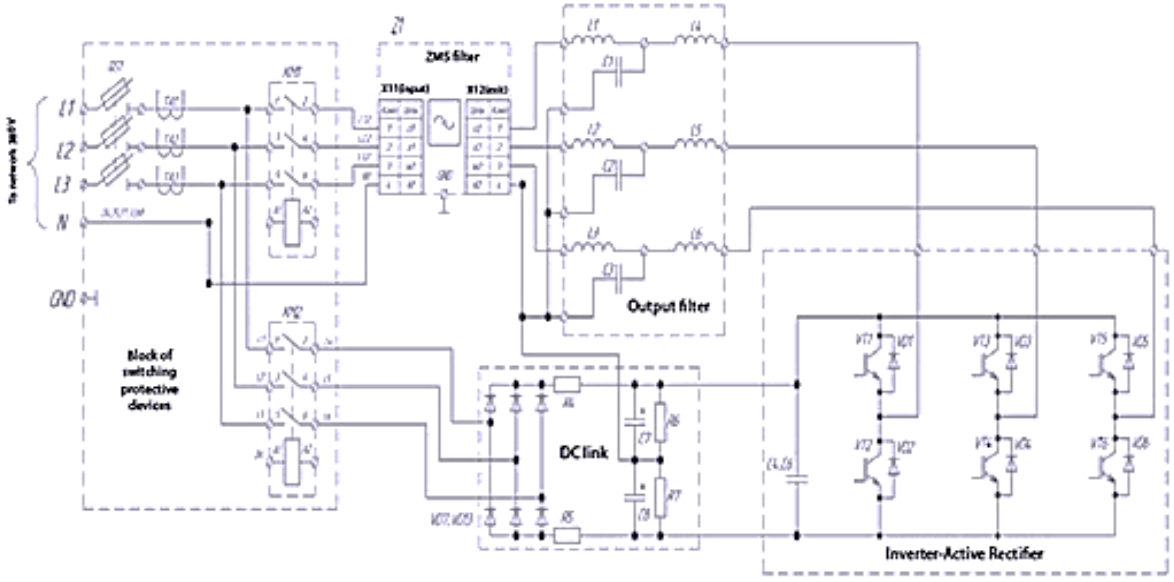


Figure 1. Circuit of AHF

To determine the efficiency, let's imagine the equations combined into a system that describe various modes of functioning of the AHF and are a mathematical model.

$$\begin{cases} \dfrac{di}{dt} = \dfrac{U - R_1 i - U_c}{L_1} \\ \dfrac{di_L}{dt} = \dfrac{U_c}{L} \\ \dfrac{di_H}{dt} = \dfrac{U_c - R_{HiH}}{L_H} \\ \dfrac{dU_c}{dt} = \dfrac{i - i_L - i_H - i_\Pi}{\mathrm{C}} \end{cases}$$

So, the parameters of the device (inductance L and capacitance C) vary depending on the input values of the system and the load. One of the main tasks of the AHF is the suppression of higher harmonics, in particular, the operation of the power grid in conjunction with frequency converters. A frequency converter (FC) is an electronic mechanism that is designed to regulate voltage or current frequency values. The device includes a rectifier that converts industrial frequency alternating current into direct current, and an inverter that converts direct current into alternating current of the required frequency and amplitude. Output thyristors or transistors supply the electric motor with the current necessary for operation.

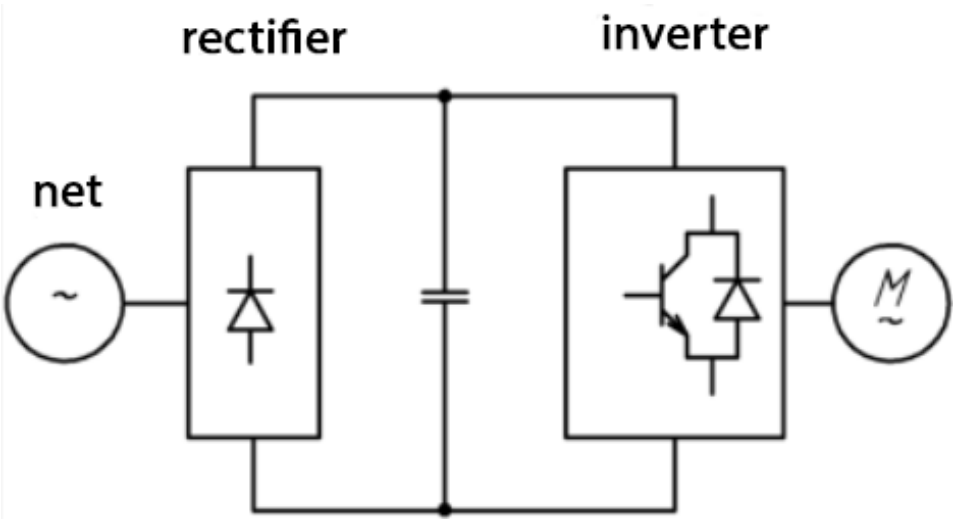


Figure 2. Circuit diagram of frequency converter

This circuit has been modeled (Figure 2). When processing the results on a laboratory bench, the ability of the AFG together with the frequency converter to compensate for the higher harmonics of current and voltage simultaneously with the correction of the power factor of the network was revealed. In particular, with the use of AHF, the value of the total harmonic component factor decreased by 93.16 % in current and by 72.14 % in voltage, and the power factor increased by 12.35 % [4].

This feature allows us to consider active filters as multifunctional devices and on their basis to create more complex electrical complexes and systems for automated improvement of the quality of electricity. At the same time, it was found that the use of AHF with a frequency converter increases the value of the consumed active power by 0.4 %, which is associated with active losses in the power switches of the active part of the filter of the compensating device (FCD) when compensating higher harmonics. Based on the simulation results, it was found that a FCD with a series active part is able to create a voltage additive to normalize the level of the mains voltage in case of its deviation due to the connection of the load in the conditions of extended power lines. When modeling, the effective value of the voltage at the moment the load is connected is 0.84 r. u. (the nominal value is taken as the basis), which is unacceptable according to the requirements of GOST 32144-2013. But when the FCD is connected, a voltage additive (ΔU) is created, the effective value is 1 r. u.:

$$\delta U = \frac{U_{ном} - U_{нагр}}{U_{ном}} * 100\ \% = \frac{1 - 0{,}84}{1} * 100\ \% = 16\ \%$$

FCD based on a series active filter, simultaneously with compensation for voltage dips, is able to suppress higher voltage harmonics, which also confirms the multifunctionality of the device. At the same time, the level of voltage harmonics is reduced by 85 %.

Based on the results obtained, the following conclusion can be drawn: when the power supply system is operating with AHF, the current curve acquires an almost ideal shape, that is, AHF suppresses higher harmonics created by electronic equipment (in this case, a frequency converter). This conclusion indicates the efficiency of using AHF in power supply systems to increase the quality of electricity. But, unfortunately, today the equipment of power supply organizations does not provide for means that automatically provide the required level of content of higher harmonic components and allow simulating consumer loads. In this regard, the problem of negative mutual influence of technical means is exacerbated. The lack of means to ensure the quality of power supply and an increase in the proportion of consumers with increased noise emissions lead to the failure of expensive equipment, failures in the operation of communication and control equipment, and a decrease in the stability of the generators of autonomous power systems. It is proposed to mandatory include in the equipment of consumers means to maintain the quality of electricity in accordance with the current regulatory documents.

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REAL ESTATE ANALYSIS OF THE CHELYABINSK REGION

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Abstract. The article presents the model of the system of real estate management by types and subjects of the market that allows systematizing and organizing the real estate market according to the demand for each of its individual types. The authors give the definition of different types of real estate, offer the methodology of constructing a model of the system of real estate management by types and subjects of the market, and classify the objects of real estate. During the study, the residential real estate market of Chelyabinsk is considered.

Keywords: real estate, supply and demand, land rent, budget, cadastral evaluation.

АНАЛИЗ НЕДВИЖИМОСТИ ЧЕЛЯБИНСКОЙ ОБЛАСТИ

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Аннотация. В статье представлена модель системы управления недвижимостью по видам и субъектам рынка, которая позволяет систематизировать и организовать рынок недвижимости в соответствии со спросом каждого его отдельного вида. Авторами дано определение различных видов недвижимости, предложена методология построения модели системы управления недвижимостью по видам и субъектам рынка, классифицированы объекты недвижимости. В ходе исследования был рассмотрен рынок жилой недвижимости Челябинска.

Ключевые слова: недвижимость, спрос и предложение, земельная рента, бюджет, кадастровая оценка.

The efficiency of rent relations in the process of land rent formation largely depends on the remoteness of sites from major cities and regional centers. One of the practiced forms of land rent extraction is land tax. Land rent received by the budget is manifested in the form of land tax, which is a local tax.

Calculation of land tax depends on differentiated tax rate, which cannot exceed 0.3 % of cadastral value with regard to lands of agricultural use and production, housing stock, engineering infrastructure, private farms, horticulture and animal husbandry. Also, the tax rate cannot exceed 1.5 % for other lands.

To test the hypothesis, we assessed the relationship between the increase in the rate of land tax and the decrease in the distance of lands of settlements of the Chelyabinsk region from Chelyabinsk.

To do this, we analyzed the results of the state cadastral valuation of land settlements in the Chelyabinsk region. For the calculations were used land plots of settlements with the highest cost per square meter, based on the types of permitted use. For this purpose, the cost analysis of types of permitted use of land plots was carried out.

Because of the analysis, it became clear that the highest cost per square meter have land plots of the following types of permitted use (in descending order):

1) Land plots designated for the placement of hotels;

2) Land plots designated for placement of middle- and low-rise buildings;

3) Land plots designated for placement of objects of trade, public catering and consumer services;

4) Land plots designed for placement of office buildings of business and commercial purpose;

5) Land plots designed for placement of ports, water terminals, railway stations, automobile terminals, airports, airfields and air terminals;

6) Land plots designed for placing garages and parking lots;

7) land plots designed for production and office buildings, structures, industrial buildings, public utilities, material, technical and food supply, marketing and intermediate goods;

8) Land plots designed for placement of power plants and servicing them;

9) Land plots designed for placement of low-rise buildings, including individual residential complexes.

To calculate the hypothesis, the structure of 10 large urban areas was analyzed, taking into account the smallest distance from Chelyabinsk.

A trend analysis of the cadastral value of real estate objects was carried out by studying its dynamics and in the context of clusters. A total of three clusters were formed. Conditions related to the permitted use of sites in different clusters were related to the fact that the approximate value of real estate objects corresponded to the dynamics for these cities. The graphs in each cluster determined the average value of the properties.

The first cluster included land plots of the following types of permitted use: land plots designated for trade, public catering and consumer services facilities; land plots designated for garages and parking lots; land plots designated for energy, servicing facilities and installations.

In the second cluster were formed such land plots as: land designed for placement of office and commercial buildings, land designed for placement of middle and low-rise buildings and residential buildings, land designed for placement of hotels, land designed for placement of ports, water, railway and road stations, airports, airfields, air terminals.

Finally, the third cluster included the following sections of permitted use: land intended for low-rise residential development, including individual residential development; land intended for industrial and office buildings, industrial and municipal facilities; land intended for mineral resources development, organization of railroads and highways (Figure 1).



Figure 1. Influence of the distance from the city districts to the regional center on the average level of cadastral value of residential areas land

The distance from the settlements of the Chelyabinsk region to the city of Chelyabinsk affects the cadastral value of these land plots, and consequently, the amount of rent for the land, which is calculated by multiplying the cadastral value of land and land tax rate. The results are presented in table 1.

Table 1 − Data on the remoteness of cities from Chelyabinsk and the average cadastral value of land plots, by cluster

Chelyabinsk districts Region	*Distance from Chelyabinsk, km*	*Average cadastral value, by cluster, in rubles*		
Kopeysk	18	1863.92	1938.98	449.545
Korkino	41	1617.62	1547.743	445.3575
Argayash	57	1054.44	537.1767	219.2675
Chebarkul	82	2160.18	1676.407	412.88
Yuzhnouralsk	90	2277.01	372.8433	602.1
Kyshtym	99	1846.20	1593.383	413.85
Miass	106	1285.33	1159.323	423.97
Plast	124	1465.25	791.1	303.905
Troitsk	136	2459.30	1603.07	1072.21
Zlatoust	145	3399.87	2199.3	553.117

Thus, the analysis of the results of the state assessment of land plots of settlements in the Chelyabinsk region, as well as the analysis of the remoteness of settlements from the regional center confirm the hypothesis put forward. In the case of Zlatoust urban district and in some cases in the case of Troitsk urban district. The high cost of land plots in these urban districts is related to the following: shortage of land, presence of tourist routes, and proximity to the border.

The privatization of land plots creates conditions in which it is much more difficult for the state to trace the legality of land use. Under these conditions, improper and inefficient land tax receipts to the budget may be formed, which is associated with inadequate use of land plots. Owners of land plots may have shadow income, which is formed because of lease relations with rent payers, while hiding these relations from tax authorities. In addition, all this leads to the leakage of investment income in terms of land rent.

Thus, research of influence of distance from city districts to regional centers on the volume of land tax rent is actual. The problems revealed in the course of the study can be successfully solved and positively influence the efficiency of rent relations in the sphere of land use.

The average price for 58.1 sq. m apartment – 2,394,488 rubles – weighted average values of the area and price among all apartments in the given ranges of the secondary market Chelyabinsk (Table 2).

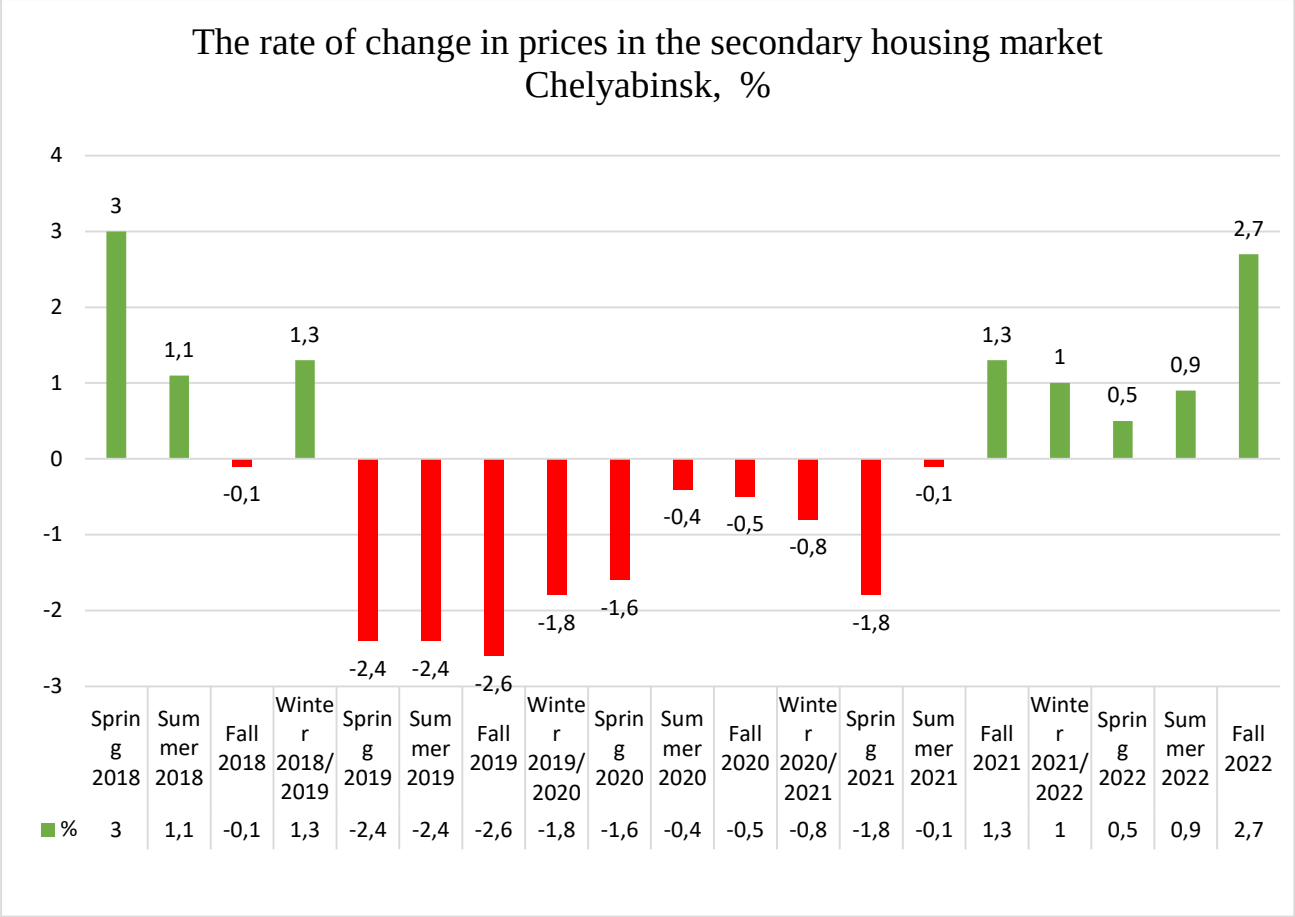


Figure 2. Analysis for secondary housing from 2018 to 2022, %

In the fall of 2022, the average offer price per square meter of total floor area of an apartment for sale on the secondary housing market in Chelyabinsk, according to the analytical department of the Chelyabinsk Regional Office of the Federal Registration Service, was 78,078 rubles.

Over the past four weeks, the average price adjustment for the city has been positive and amounts to 1.0 %, and 4.9 % since the beginning of the year.

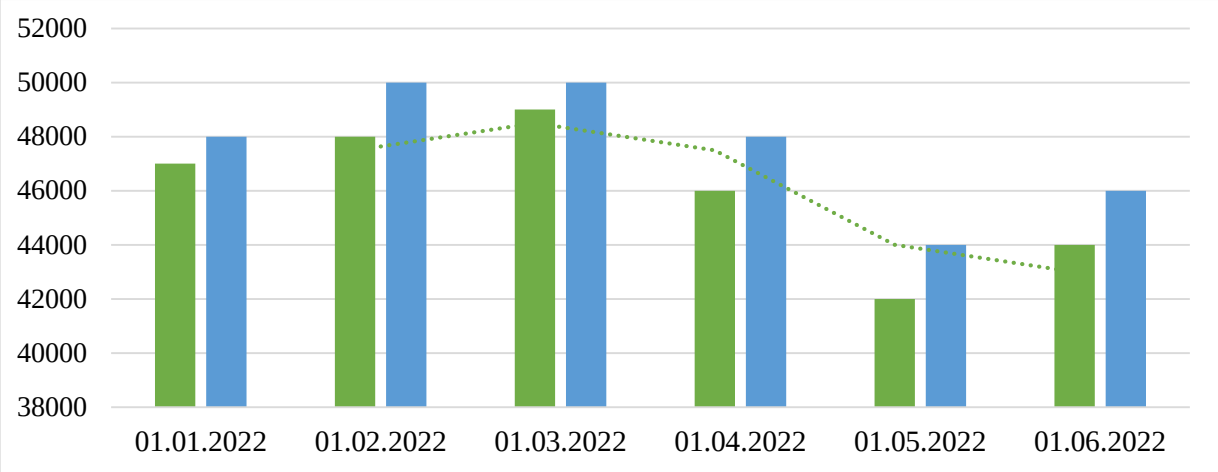


Figure 3. The dynamics of the secondary real estate market in the Chelyabinsk region for six months

Chelyabinsk region there is a decrease in the price of the average value of the proposal on the background of the average cost of transactions. There are no abrupt changes, unambiguously the cost of supply on average will be about 3 %.

The level of difference of supply and actual transactions in the average cost per square meter is not equal to the indicators at the beginning of the year, the average cost per square meter remains at the mark of 40 thousand rubles.

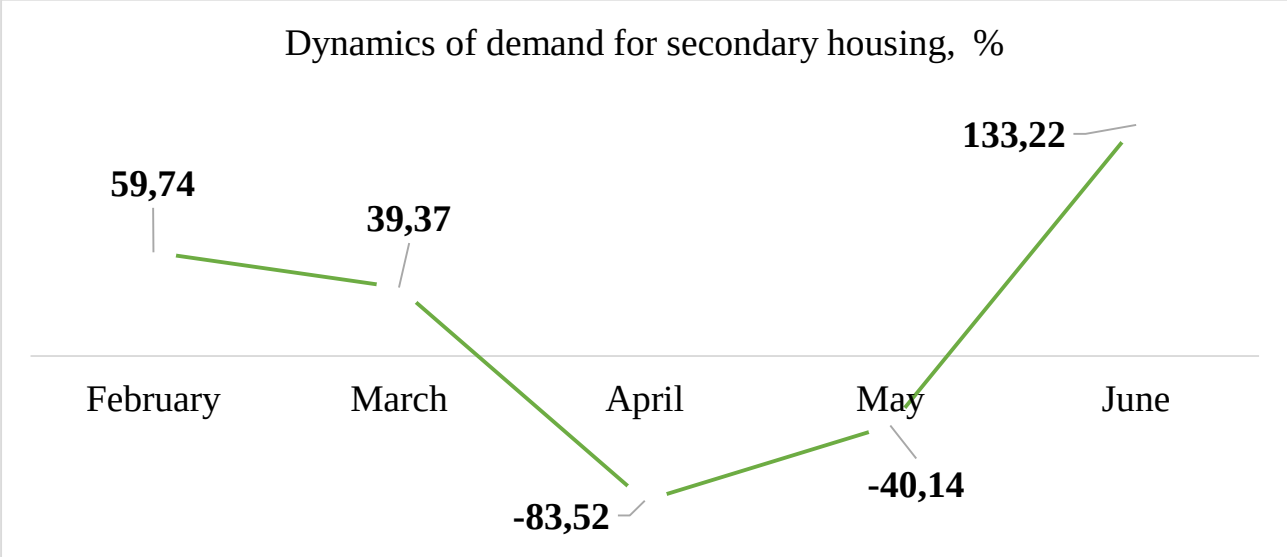


Figure 4. Difference in demand between months as a percentage of secondary housing, %

Dynamics of demand based on the mortgage demand market for secondary housing. The green line indicates the dynamics of demand in percentage terms, as opposed to the previous month.

Table 2 − Average price of apartments in Chelyabinsk per square meter, January 6, 2022

Number of rooms	*Middle price*	
studio apartments	40 313 руб/м²	651 $/м²
two-room apartments	39 485 руб/м²	638 $/м²
three-room apartments	40 257 руб/м²	650 $/м²
large apartments	41 627 руб/м²	672 $/м²

Real estate prices since the beginning of the Ukrainian events have behaved like the dollar in exchange offices: most sellers have jerked prices up to the upper limit of their fears [1; 2; 3; 4; 5]. This is due to a desire to play on the hype, and to explain it by a rise in prices for building materials or something else is a matter of individual choice for builders.

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THE FEASIBILITY OF USING AN ENERGY-EFFICIENT "SMART HOME" SYSTEM

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Abstract. Every year more and more technological solutions for managing equipment and devices appear in residential and public buildings, and accordingly, the market begins to offer an increasing number of objects equipped with the Smart Home system. Such integrated solutions should provide high living comfort and allow you to manage an unlimited number of devices. This article discusses how justified the introduction of the system is and whether the costs of its acquisition can pay off due to savings on housing and communal services.

Keywords: energy saving, Smart Home system, energy efficiency, cost calculation, energy audit.

ЦЕЛЕСООБРАЗНОСТЬ ПРИМЕНЕНИЯ ЭНЕРГОЭФФЕКТИВНОЙ СИСТЕМЫ «УМНЫЙ ДОМ»

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Аннотация. С каждым годом все больше технологических решений по управлению оборудованием и приборами появляется в жилых и общественных домах, а соответственно рынок начинает предлагать все большее количество объектов, оборудованных системой «Умный дом». Такие комплексные решения должны обеспечивать высокую комфортность проживания и позволять управлять неограниченным количеством устройств. В данной статье рассмотрено, насколько оправдано внедрение системы и способны ли затраты на ее приобретение окупиться за счет экономии на жилищно-коммунальных услугах.

Ключевые слова: энергосбережение, система «Умный дом», энергоэффективность, расчет расходов, энергоаудит.

Ever since the stone Age, man has tried to improve his environment. With the development of civilization, he also made his home more comfortable. Technological progress has radically changed the way of life of a person, namely: the Internet, electricity, transport and other benefits have made adjustments to our life and transformed it.

A smart home is a building that is equipped with an automated complex, which in turn simplifies the management of building equipment. For example, automatic control of heating, ventilation, water supply, and any other systems that the customer wants to include in such a system. This technology helps to simplify a person's life, in particular, household chores go by the wayside. Smart home technologies include not only super-scientific inventions, but also very common ones, like robotic vacuum cleaners and video cameras.

One of the first smart houses is considered to be the "House with Buttons" developed in 1950 by Emil Mathias. He was able to remotely control lights, garage doors, household appliances with a few kilometers of wires. And also set up a security system inside the home. The engineer controlled his invention with the help of buttons.

Soon there was an Electronic Computing Home Operator – an au pair. Which included a wide range of functions from turning off kitchen appliances to archiving recipes [1]. The device of the Smart Home system is shown in figure 1.



Figure 1. Smart home device

The principle of operation of this technology is based on the fact that everything is controlled by a computer that collects and processes the signals that come to it using various sensors located throughout the house and site. Cables and radio waves are responsible for signal transmission.

Sensors (responsible for movement, humidity, pressure, light intensity, flooding, and so on) capture changes and transmit them to the control unit.

There are also systems that do not have central control, where each structural unit decides for itself, which signals need to be read from the detectors. Subsystems interact with each other and react according to the situation. Now home control is possible using a laptop or smartphone [2].

When building such a house, they start from the desires of the developer and future residents, but there are mandatory functions, for example, remote control of heating and electrical systems, as well as systems responsible for the safety of the house and its inhabitants, as well as ventilation and air conditioning.

There are many components in a smart home:

A) To control temperature and humidity, there are temperature and humidity sensors, respectively, which are located in each room, weather stations on the street. This makes it possible to control the temperature of the house when leaving it, opening/closing windows for ventilation. Upon the return of residents, the elements begin to work in a different mode, quickly bringing the room to a comfortable temperature and humidity [3].

B) In the house, the lamps are controlled remotely, this also applies to the mode of operation. External lighting points are controlled by twilight sensors. In some houses it is possible to set up from selected lighting points, the so-called light scenes. They are used where it is worth creating individual lighting (living room, kitchen, etc.). In addition to the above, light control makes it possible to simulate the presence of someone in the room, which is associated with a security function.

C) One of the most common smart home features to use is multi-room. This is the name of the multi-zone sound system and home theater. The system, when used in combination with speakers and controllers, makes it possible to use modern audio equipment throughout the home.

D) It is safe to call alarm and monitoring one of the most important functions of the house. After all, they are necessary to protect the house from all sorts of situations from theft to gas leaks or fires.

The "panic" button, which is installed near the bed, is responsible for sending information to the security service, giving a signal, turning on the light. There is also a button that is responsible for turning off all unnecessary appliances during the absence of the owners, which minimizes the possibility of an emergency.



Figure 2. Smart home control

However, there are both pros and cons to using a smart home. Starting with the benefits, security should be at the top of this list, as it is the fundamental good that all people aspire to. The smart home system will give a signal and take action in the event of a home invasion, an emergency (fire, flood, gas leak), but before that, it will reduce the risk of its occurrence, since your electrical appliances, etc. will be under control. And video surveillance will help you monitor your home from anywhere on the map.

Secondly, the flexibility of the system, namely the ability to customize the system completely for yourself, settings, interface or voice of your assistant. Thirdly, savings, we will get acquainted with this point in more detail in the next paragraph.

The next thing to mention is ease of use and automation. Residents of the house do not need to delve into the system or understand a million wires, just a regular phone is enough to control and now your house is completely automated. Also pay attention to the design, because the aesthetic component is also important. The smart home system fits perfectly into the interior.

A significant factor is to contribute to the environment. After all, saving energy resources leads to the solution of a number of environmental problems that are a priority for many countries. In conclusion – comfort or convenience: after all, a comfortable temperature, household help, entertainment in the house, automatic blinds and curtains, well, at least they will make life more convenient and practical.

Next, let's look at the disadvantages of this invention.

1. High cost of setting and maintenance. Here the owner needs to think about how expedient it is to install this system. Despite the fact that the mechanism of the system for the most part consists of simple sensors, cameras, sensors, the price remains quite the same. It takes several years to pay for this system.

2. The complexity of introducing this system into an already finished house.

3. Human factor. An important risk for the owner of the house, who decided to install this system, is the mistakes of the masters.

4. Sensitivity to pressure drops in the network, from which not only individual parts, but the entire system as a whole can fail. In order not to meet with a similar problem, owners should think about providing constant power (backup equipment).

Although one of the main disadvantages of a smart home is the cost of its installation and maintenance, but as statistics show, on average, a smart home is able to reduce spending on utilities by 20-30 % due to [4]: reducing electricity consumption; control of water and gas consumption; automated regulation of the heat supply system.

For example, energy savings are achieved:

- the possibility of competent shutdown and careful use of lamps in the house, reducing the time of use.

- installation of smart sockets. Various models allow you to control the connected devices remotely, as well as configure the on and off of all devices according to an individual mode. We also include important options: the ability to set a timer and monitor energy consumption. Water heaters and boilers can also be connected via smart sockets. Which makes it possible to configure the automatic shutdown and inclusion of the boiler. That will allow you to remove the work of the boiler from the problems throughout the night.

When using technology, savings and water supply occur. Most often, people use meters to control the consumption of water consumed, but its presence does not solve the problem of saving. The reason for the overrun is the negligence of the residents and water leakage.

Sensors that monitor leakage will help to cope with the last difficulty. To date, there are full-fledged complexes designed to protect against leaks and flooding of apartments. Sensors connected to the central unit respond to non-standard situations and promptly block cold and hot water supply. The system instantly responds to pipe breaks, tap leaks, overflows from sinks and bathtubs.

But devices and a well-configured smart home application cope with irrational consumption. So, in the main application, you should set the control mode and water flow.

One of the strong factors in the use of the "Smart Home" system is the savings in heat supply. Due to the ability of the system to analyze the ambient temperature indicators, it controls the temperature regime inside the room. This system helps to reduce consumption by 5 kWh per day.

When there are no people inside the smart home, all devices are turned off (which the owner himself chooses). The system can track the owner's approach to the house using GPS and turn on the devices necessary for life support. This plays an important role in saving heat supply.

The smart home system is a real breakthrough in the development of mankind. What our ancestors dreamed of comes into our everyday life today, but the installation of this system is not suitable for everyone now, since the cost of maintaining it exceeds

the capabilities of a lot of people. Here you need to carefully calculate your costs and understand whether you need this system and how much it pays off.

But if you decide to install the Smart Home system, then there is confidence that you will not regret it, because you will live in a comfortable living environment, forgetting about many everyday problems, and also in complete safety.

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PSYCHOLOGICAL PRINCIPLES OF TEACHING ENGLISH

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Abstract. The article discusses the psychological principles of teaching English, discusses the concept of the “best method” of learning English, and also talks about the problem of separating the study of phonetics and grammar.

Keywords: English, psychology, education, teaching.

ПСИХОЛОГИЧЕСКИЕ ПРИНЦИПЫ ПРЕПОДАВАНИЯ АНГЛИЙСКОГО ЯЗЫКА

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Аннотация. В статье рассматриваются психологические принципы преподавания английского языка, представлена концепция “лучшего метода” изучения английского языка, а также говорится о проблеме разделения изучения фонетики и грамматики.

Ключевые слова: английский язык, психология, образование, преподавание.

Teaching is one of the basic training activities of the degree course in Language Sciences that allow the student to acquire knowledge and understanding of the basic principles in the glottodidactic area related to foreign languages. The objective of the course is to develop the knowledge and understanding of the (historical) role of psychology in the field of Glottodidactic as well as to promote the ability to recognize the links between the different psychological aspects and glottodidactic responses in order to allow students to develop the skills that allow them to advance well-founded glottodidactic responses for specific situations [1, p. 279]. For centuries, foreign languages have been studied and learned, and some question what is the “best method” to learn English.

The European continent has a bilingual tradition, of course: the vernacular was the language spoken at home, but educated people used Latin for written or even oral

exchanges of a more formal nature. Since the Middle Ages, therefore, there is a “glottodidactic tradition”, aimed at teaching Latin. Having developed on the basis of a second written language (and, if not dead, however almost crystallized), traditional glottodidactics was based on reading, writing and translation. The learning proceeded from the grammatical rule to the application through written exercises, and the aim was to bring the learner first to read and translate from Latin, and secondly to write in Latin. After all, the learners were certainly not children, but educated young people who had decided to dedicate their lives to studies (which was very rare and prestigious) [2, p. 228]. Various methods of structuralist matrix were developed. The theorists are almost all psychologists, of a behaviorist matrix (a branch of psychology that had had a great development, even at the level of politics and propaganda: in fact, now it was able to modify and predict the behavior of the learners and they try to use these notions even in the classroom):

− audio-oral method: With the development of audio systems, we are witnessing the popularity of the first recording-based method. The student is extremely passive and is subjected to a series of intensive repetitions of words and phrases (called “drill”, drill), to make the new material “engrave” in the minds of the students, who should automate their knowledge.

− communicative approach: completely different in philosophy, the communicative approach brings together a series of strategies aimed at leading pupils to learn to communicate. They are taken into consideration pronunciation, phonetics, grammar, vocabulary, but these aspects are not taught separately but within the communication process and in a functional way to it. From here come some things that are familiar to us, such as the fact that units begin with a text (usually a dialogue) and the “technical” aspects (grammatical analysis, lexicon...) start from communication put as an example of openness and development to it.

− situational method: it is part of this current, the fact that the initial dialogue is situated and students are brought to practice through the “role pla pla the communicative-situational method gives an increasing importance to the fact that students must learn through real communicative acts (even if mimed “by pretend")

− functional method: as the word says, it focuses on "linguistic functions “, or communicative intentions (ask for info, get acquainted, make a complaint...) Even today our textbooks are divided by” communicative functions “or in the index you can find next to the grammatical rules addressed in each unit also which” linguistic functions" are presented. We can well say that many strategies and concepts of the structuralist period have basically survived to us. Just take a tour in secondary schools or browse through a manual to realize the great predominance of this routine: the unit is communicated with a dialogue or a text, which is read and analyzed collectively, then the teacher presents the target grammatical rule of the unit (or the communicative function), then the rule is practiced in written exercises, then goes on to spoken practice). Great importance is given to grammar, still practiced with repetitive “drill "

exercises. Translation from one language to another is considered a glottodidactic tool [3, p. 56].

The phrase "principles of learning" is used in educational and psychological literature when talking about the positive or negative consequences of different approaches. On the one hand, this is done to distinguish between" general educational principles "and"specific environmental factors, psychological principles or any other factor that may affect learning". The first group focuses on general and universal aspects of learning and learning, such as the principle of universality, which states that all students should have access to content regardless of their background or cognitive abilities [4, p. 218].

During the primary school period, children do not always understand what emotion they themselves or others are experiencing; it is still difficult for them to distinguish between certain emotions. They usually find it much easier to experience and express their emotional states in circumstances already experienced or similar, but still have difficulty describing their emotional experience. Since children perceive only positive emotions in preschool age, it is still much easier for them to identify emotions of joy even at school age, while it is difficult for them to identify many other emotions, for example, stupor, dislike or guilt. However, now they become more susceptible to oppressive circumstances and can empathize with others. Since younger students have not yet fully mastered the whole range of emotions and feelings, as well as their manifestations, it is not uncommon for them to be very similar in their behavior to their relatives or teachers. During the primary school period, children are still at the stage of development of emotional self-regulation, so they are not always able to control the manifestation of certain emotions. Because of this it is still difficult for them to observe complete silence and order during the lesson. However, very soon they become able to control themselves and show or not their feelings and experiences according to a particular situation. The level of ability to manage one's emotions gradually increases and improves [5, p. 190].

Good learning promotes the self-learning of a student who seeks to master what he teaches in such a way that students develop the habit of learning for themselves. Also, the student should not be afraid to make mistakes and risk calculation. The teacher should not approve of the teaching principles that include spoon feeding. It might start by taking classes, but gradually introduces students to applications specific to learning topics and encourages students to explore. Wherever they need help or direction, they stay in the background to show it. The principles of learning show that learning is a tripartite interaction between teacher, student and subject. This requires collaboration between teacher and students. Nowadays, the idea of teaching and learning has changed. It is no longer a read-only procedure. Now the focus is on the student, not the teacher. It is very important to know that the student is cooperating and that his interests are real. Research in cognitive psychology and pedagogy has helped teachers improve a child's learning rate. Teams like Classplus can help improve a student's performance, whether you teach psychology or other subjects.

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AUGMENTED REALITY IN CONTEMPORARY FASHION DESIGN

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Abstract. This paper discusses the history of augmented reality (AR) technology as well as successful examples of their application in clothes design.

Keywords: design, clothing, augmented reality, technology, digital clothing.

ДОПОЛНЕННАЯ РЕАЛЬНОСТЬ В СОВРЕМЕННОМ ДИЗАЙНЕ ОДЕЖДЫ

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Аннотация. В работе рассматривается история создания технологии дополненной реальности, а также успешные примеры применения данных технологий в дизайне одежды.

Ключевые слова: дизайн, одежда, дополненная реальность, технологии, цифровая одежда.

Modern technologies are progressing faster and faster every day, new forms of everyday things are invented that surround us every day. Design, in turn, does not stand still; in fact, any changes that have occurred in the world, in politics, economics, religion and other fields are first reflected in the work of artists, clothing designers and musicians. Through creativity, people can tell their stories, share their joy, bring something unique to their work. Just as in the rest of our lives, various forms of creativity are increasingly moving away from material reality into the world of virtual reality.

Now, the most active development is taking place in the areas of virtual and augmented reality. It is critical to understand the distinction between these areas. Virtual reality (VR), for example, is a world created through the use of various technical means in which a person can find himself or herself, using technology designed to be fully immersed in it, such as virtual reality glasses, special suits or even entire rooms. Virtual reality is aimed at fully imitation what is going on around a

person, and the most complete transmission of both human impact on the recreated surrounding world within the virtual space, and transmission the response of that world to the impact coming from a person [1].

Augmented reality is a technology aimed at complementing the real world limited only by human imagination and the power of devices. Augmented reality is more accessible to the population because it is not based on the use of additional expensive equipment, but on the use of a common smartphone camera, which the vast majority of people possess.

The aim of VR is to suppress reality and immerse users in the digital world, AR only adds digital objects to reality [2].

The development of these trends dates back to 1961, at which time the technology was developed by Philco Corporation and was intended for military purposes. In 1962, Morton Hayling invented and patented the world's first virtual reality simulator, Sensorama, which was a large device resembling the then-common slot machines and looked as follows (Figure 1):



Figure 1. Sensorama simulator

This device caused distrust in the population and full-fledged development began only in 1980, but the birth of this technology began that way [3].

Clothes are an integral part of our lives, each generation has its own unique style, our age is the age of technology, the age of science, respectively, and clothes should also be technological. Modern ways of connecting the real world and the digital world are very different from what they were originally, space for imagination, advanced technology, clear and simple operating principles have helped thousands of artists, IT professionals and designers to bring their unique product to the modern market.

It is already possible to create an avatar according to your parameters and try on clothes on yourself. In 2016, Bitmoji and Bergdorf Goodman developed a concept that allowed people to try on clothes from fashion designers such as Posen, Alexander Mcqueen and Calvin Klein without leaving their own homes.

Brands are moving away from bespoke tailoring to digital-only versions of their clothes. For example, a digital dress created by the startup The Fabricant was sold for $ 9.5 thousand, while this dress has no material basis (Figure 2) [4].



Figure 2. AR dress from start-up The Fabrican

There are many advantages of such clothes: they do not wear out, they do not require any materials, they do not need to be washed, they do not need to be cared for, they are able to change depending on person's figure, in addition, such clothes are environmentally friendly.

Russian designers are also developing in this direction. The VKontakte team, together with the Esthetic Joys studio, developed a domestic collection of clothing with an augmented reality effect, including a hoodie, T-shirt, bag, scarf and hat (Figure 3) [5]. Each of these items has a QR-code on the tag, scanning which one can see how 2D images become three-dimensional, move, go beyond the perception of the human eye.



Figure 3. Clothing with AR technology from VKontakte and Esthetic Joys studio

So far, it's still in its infancy, but we believe that in the near future it will be difficult to imagine life without a digital wardrobe, which is great because digital clothes are not subjected to the laws of physics, nature, it is limited only by the imagination of the author, and the moment the technology of creating such clothes widespread, each person's clothes will be truly incredible and unique.

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INNOVATION COLLABORATION AND RESEARCH BETWEEN UNIVERSITIES AND INDUSTRY

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Abstract. This article is of particular value for universities that have the necessary resources as driving forces for the development of the territory on which they are located. The scientific novelty and significance lie in the assumption that the solution to the problem of effective cooperation between universities and industry lies at the heart of the implementation of new business incubator formats aimed at qualitative and quantitative changes in the nature of this cooperation to ensure both mutually beneficial digital cooperation and ensuring the level of research potential.

Keywords: innovations in cooperation, university industrial cooperation, strategy, innovation, research, systematic review of literature.

ИННОВАЦИИ СОТРУДНИЧЕСТВА И ИССЛЕДОВАНИЯ МЕЖДУ УНИВЕРСИТЕТАМИ И ПРОМЫШЛЕННОСТЬЮ

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Аннотация. Статья представляет особую ценность для университетов, которые обладают необходимыми ресурсами в качестве движущих сил развития территории, на которой они расположены. Научная новизна и значимость заключаются в предположении, что решение проблемы эффективного сотрудничества университетов и промышленности лежит в основе реализации новых форматов бизнес-инкубаторов, направленных на качественное и количественное изменение характера данного сотрудничества для обеспечения как взаимовыгодного цифрового сотрудничества, так и обеспечения уровня научно-исследовательского потенциала.

Ключевые слова: инновации в сотрудничестве, университетско-промышленная кооперация, стратегия, инновации, исследование, систематический обзор литературы.

Efforts to find solutions to complex social, environmental, and economic problems-for example, in the areas of energy, environment, health, or security-increasingly require collaboration between universities and industry, as few organizations have the internal capacity to achieve results on their own.

This research allowed studying and describes the existing scientific literature on innovation strategies in the relationship between university and industry. Therefore, the aim of this study is:

1. Identification of the most effective form of interaction between regional universities and industry;
2. Strengthening partnerships between regional universities and industry, the market.

The objectives of this article are:

1. Detailed analysis of interaction between universities and industry
2. Identification of the need for such a partnership
3. Address key barriers
4. Analysis of the positive and negative aspects of digital business incubators.

Object of research: a new model of cooperation between the university and industry-digital business incubation.

The subject of the study is the impact of business incubators on cooperation between universities and industry.

Methods. A comparative analysis of the characteristics of the interaction between universities and the real sector of the economy has been carried out, the key reasons that impede effective innovative cooperation have been identified, and a new type of business incubators has been considered as one of the key areas of innovative development. Many of the ideas derived from research at universities find application through collaboration between universities and firms. Others enter the market through licensing or start-ups.

It is important to note that cooperation between universities and industry implies not only cooperation between universities and industry, but also the state. Educational institutions pursue the goal of obtaining the relevance of scientific research and employment of graduates, attracting additional sources of funding. Industrial enterprises are considering universities as potential partners.

The importance of knowledge sharing between public institutions and private organizations has long been widely recognized as a significant phenomenon. A look at the economies and levels of innovation in industrialized countries shows that their efficiency is driven by the production of knowledge and its use in industry, which allows them to achieve competitive advantages in global markets. Thus, cooperation between universities and industry can facilitate the transfer of knowledge and stimulate the production of new knowledge and technologies Cooperation between universities and industry includes joint research, research contracts or scientific advice, the results of which are put into practice-in a process comparable to technology transfer for commercialization-to many researchers.

While universities and their industry partners have different goals, they also have complementary skill sets. Each of them contributes something different to the process

of innovative discoveries. University researchers are good at finding complex problems and have the freedom to look for different solutions; companies are good at making discoveries and developing them.

Investments are different, but complement each other. Having these complementary skills is a surefire formula for a successful partnership.

These mutually beneficial partnerships can lead to groundbreaking research and innovation that solves complex problems, spurs economic growth, and creates a more skilled workforce.

To establish and maintain strong collaboration between industry and the university, faculty must think and act like entrepreneurs. This means actively seeking out industry partners, developing a sustainable business model, maximizing limited budgets, and presenting value and ideas to potential industry partners.

Speaking about the interaction of universities and industry, it should be noted that the fundamental factor is the conduct of research and development on the basis of the university, which will be useful and important for industry. The university currently offers knowledge-based products and services.

The need for cooperation with business for universities is as follows:

1. Acceleration of the innovation process;
2. Obtaining additional funding in addition to the state and sharing the costs of research activities;
3. Feedback from the industry, mentoring and mentoring from the industry and business;
4. Jobs for university graduates;
5. Availability of researchers working in enterprises and receiving up-to-date information on leading trends and market requirements;
6. Elimination of risk and uncertainty due to inconsistencies in the demands of the university industry;
7. Access to practical knowledge of the industry and the development of research based on the knowledge gained.

Business innovation is closely linked to research and development (R&D) contracts, suppliers, customers, and competitors. However, each type of R&D collaboration is different in terms of the breadth of new knowledge provided to companies and the ease of access to this new knowledge, resulting in different impacts on product innovation. Since universities have taken on the mission of research and technological development, the role they play in this process is essential. There are at least two main trends that influence the future role of universities: (1) the transition to a growing dependence of the economy on knowledge production, and (2) an attempt to identify and shape future trends in knowledge production and their implications for society. There is a transition from a manufacturing economy to the socio-economic processes of modern innovation systems, when universities become part of a new knowledge infrastructure [1].

Most often, it is cooperation between industry and academia that is the main condition for the transfer of scientific knowledge to industry. Such a transfer should be

based on the interests and mutual benefit of both parties. The university should not strive to receive high incomes from the exploitation of IP.

There are four main reasons why companies partner with universities to create innovative products:

1. Companies tend to fund R&D. Companies that partner with universities frequently have government funding available.
2. Companies seek access to basic scientific knowledge. Participation allows them to better understand the technologies themselves, which expand the knowledge base.
3. Companies seek to address issues through consultation with universities on ongoing research and development programs. Researchers in these cases participate in testing, perform tests, participate in R&D and provide feedback on projects.
4. Cooperation with universities leads to common benefits that go beyond the narrow goals of specific unions.

If there is a system of innovation support in the scientific community, its functioning should be evaluated.

Governments often play a role in these types of cooperation. Their participation tends to grow and varies significantly depending on the country. Trilateral partnerships between industry, government, and university are sometimes referred to as the Triple Helix.

The government's interest, in turn, is to find tools to modernize the economy and ensure technological progress. There are various models of public policy that stimulate these processes; each of these models uses its own set of tools: the organization of relevant committees, the provision of additional funding, government orders and legislation. Due to the intersection of interests, cooperation between universities and industry has led to the development of this kind of cooperation on a global scale [2].

How can a university find an industry partner? According to industry leaders, the two most significant aspects they pay attention to when launching a new project are the university partner:

− With a common history of successful cooperation
− Work in the same research fields with a similar research program

How do I find potential partners who meet one or both of these requirements? One piece of data that can evaluate and help you solve this puzzle is publication data. You can determine which industry partners you share your co-authored works with. Alternatively, you can evaluate articles by potential corporations to find out in which areas they are published.

The digital business incubator is one of the newest and most technologically promising formats of interaction between universities and the industrial sector in the era of the digital economy. The creation of a new type of business incubation will increase the competitiveness of the university. It is important to note that the business incubator not only allows you to establish partnerships with the industrial sector, but also allows you to increase the attractiveness of universities for professors, students and applicants, as well as to increase the competitiveness of the region as a whole. The main task of the business incubator is to select and attract innovative enterprises,

provide them with organizational, educational and other types of support. The difference is that startups can be geographically located in other regions, but they will be connected by the incubation network of the university. In addition, the incubator within the framework of the open innovation model can attract foreign enterprises and investors, as well as scientists to cooperate. The socio-economic situation of the region plays a significant role in the choice of serious enterprises and investors of their partners. A digital university business incubator should have the support of regional authorities so that an investor who is ready to work with innovative projects grown in a business incubator is confident that his assets will not become the property of other companies [3].

Universities are the source of innovative development of the territory, they should also stimulate innovative activity, including by creating an innovative infrastructure that will contribute to improving both the competitiveness of the higher educational institution and the competitiveness of the territory of its location, which is the strategic objective of the university.

The creation of business incubators in the regions that will interact with the central sites will be considered as divisions of the university that have a minimum area for the development of both the company and the university students.

Let's take an example of one of the largest business incubators in Moscow. The HSE Business Incubator is a structural unit of the National Research University Higher School of Economics. They have created a separate educational course within which students can disseminate and receive information about the achievements of the project team, as well as check the results of their activities. The HSE Business Incubator has the right to assist in the development of the project, advise the team on all issues arising during the implementation of the project, provide the project with information promotion and attract experts for consultations. A new model of "digital business incubation" will be created on the example of this model, but with the interaction of regional points. Now organizations will be able to create their own projects in other regions [4].

Differences between digital business incubators and traditional ones:

1. Startups and digital business incubators may be located geographically in other regions, but they will be connected by the university's incubation network, the platform;
2. More adapted to the requirements of the modern digital environment;
3. Selection and attraction of innovative enterprises, providing them with organizational, educational and other types of support;
4. This type of incubator can attract foreign enterprises and investors, as well as scientists to cooperate.
5. Orientation to education. It represents itself as a division of the university, as a necessary element of entrepreneurial education for the university itself and enterprises in which mentors will be.

6. Research orientation: All participants should be active in scientific and technical research. It also implies bidirectional flows of knowledge and information between universities and industries.

Based on a comparative analysis, the positive aspects of a new type of business incubation are revealed: This is one of the most technologically promising formats of interaction between universities and the industrial sector in the era of the digital economy. It is important to note that the digital business incubator not only makes it possible to establish relations between universities and industry, but also makes it possible to increase the attractiveness of universities for professors, students and applicants, as well as to increase the competitiveness of the region as a whole.

Technical and technological solutions. It is important to note that the digital business incubator will develop in the presence of a “central office”. Mentors and curators will be present in each region, in each university. The curators are graduate students, young university teachers, scientists who are able to organize the work of the student team on a specific project and mentors who manage the activities of such business incubators and provide reports on projects to the “central office”. The tasks of the curator include regular meetings with students involved in the project, setting tasks and monitoring the implementation of key points on the project.

Technically, this business incubation model will have information support through a social network (a network for communication of participants, curators, and trainers), as well as through an interactive database and an intelligent system of recommendations located on an information portal, which will set out the requirements, stages, and selection of students' projects, the level of implementation of their ideas.

The main result of such an “innovative business incubation model” is the practical implementation of projects of students studying at regional universities (their step-by-step study and implementation), as well as the collective examination of new ideas (discussion by the whole community). This will expand opportunities for participants and reduce costs for the university. This model allows regional universities to strengthen their positions in the educational services market due to the possibility of cooperation, the use of modern technological solutions in their activities, as well as ultimately increase the competitiveness of the region. The model of the digital incubator is practically applicable for the main universities whose main task is their innovative development, but in the process of growth and development, this project can be expanded for the entire population of this region [5].

The theory of decision-making. Methods of working with large databases. As it was noted, the role of universities in the formation and management of business incubators is very important. Universities, on the basis of which there are business incubators, provide an opportunity not only to gain knowledge, but also to test their ideas under the patronage of professors and specialists.

Currently, an excess of information leads to a significant loss of students' attention, and there is a difficulty at the stage of finding students and involving them in project activities. One of the promising and labor-intensive ways will be the use of an intelligent information search engine, with the help of which students who wish to

become residents of a business incubator will receive assistance in finalizing a business idea, searching for an innovative business model for their service. The system being created should ensure the operation of the following functions:

1) data entry;

2) data storage;

3) viewing data;

Questionnaires will be sent to students, which will take a small amount of time to complete. Students will be elected on the basis of questionnaires. A bot will also be created, which will store information about existing projects. Thanks to the bot, each participant will be able to find a team of like-minded people and fill out information about themselves in this system. An intelligent assistant can be created on the basis of the Telegram messenger or on the basis of an educational platform. Creating intelligent assistants in the form of chatbots will help solve the problem of finding students.

The developed system scales well, in particular, the resources created can be used not only for searching among students, but also among the population of a given city. This article presents possible limitations and obvious opportunities that exist in the interaction of universities and industry. No one doubts the fact that the activation of this interaction is the key to the success of higher education institutions, especially in the digital economy. That is why the author proposed a spiral model of such interaction, including as an integral element of the digital world [6].

There are a number of practical recommendations based on the conducted research that can be useful when deciding on the introduction of new formats of interaction with business at your university:

1) universities need to create a value proposition for interaction that is of interest to industry and business;

2) the use of modern digital technologies in interaction with industry is a fundamental factor of effective interaction;

3) partnership should become a key concept that is the basis of value.

The digital business incubator demonstrates the need for its application, since it is more adapted to the requirements of the modern digital environment. Business incubators are considered as an effective mechanism for the development of small business, as a bridge and channel in the development of the economy of both the territory and the university as a whole. The process of business incubation becomes a mechanism for the commercialization of scientific developments, as an infrastructure that stimulates the economic development of universities, industry, and the territory.

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COMPARATIVE ANALYSIS OF COOLING TOWERS

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Abstract. The paper presents the most popular types of cooling towers in industry are analyzed. The classification, advantages and disadvantages of cooling towers are considered, as well as their technical, economic and environmental characteristics. The principle of operation of each type of cooling towers is analyzed.

Keywords: fan cooling towers, cooling towers, crossflow cooling towers, ejection cooling towers, dry cooling towers.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ГРАДИРЕН

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Аннотация. В работе проведен анализ востребованных типов градирен в промышленности. Рассмотрены классификация, преимущества и недостатки градирен, а также их технико-экономические и экологические показатели. Разобран принцип работы каждого типа градирен.

Ключевые слова: вентиляторные градирни, башенные градирни, поперечноточные градирни, эжекционные градирни, сухие градирни.

A cooling tower is an industrial plant designed to cool the circulating water used to remove heat from process equipment in circulating water systems. Today cooling towers are the most efficient cooling devices in industry. They are used at industrial plants, nuclear power plants, and thermal power plants to remove heat from process equipment and increase production output. The classification of cooling towers is shown in figure 1 [1].

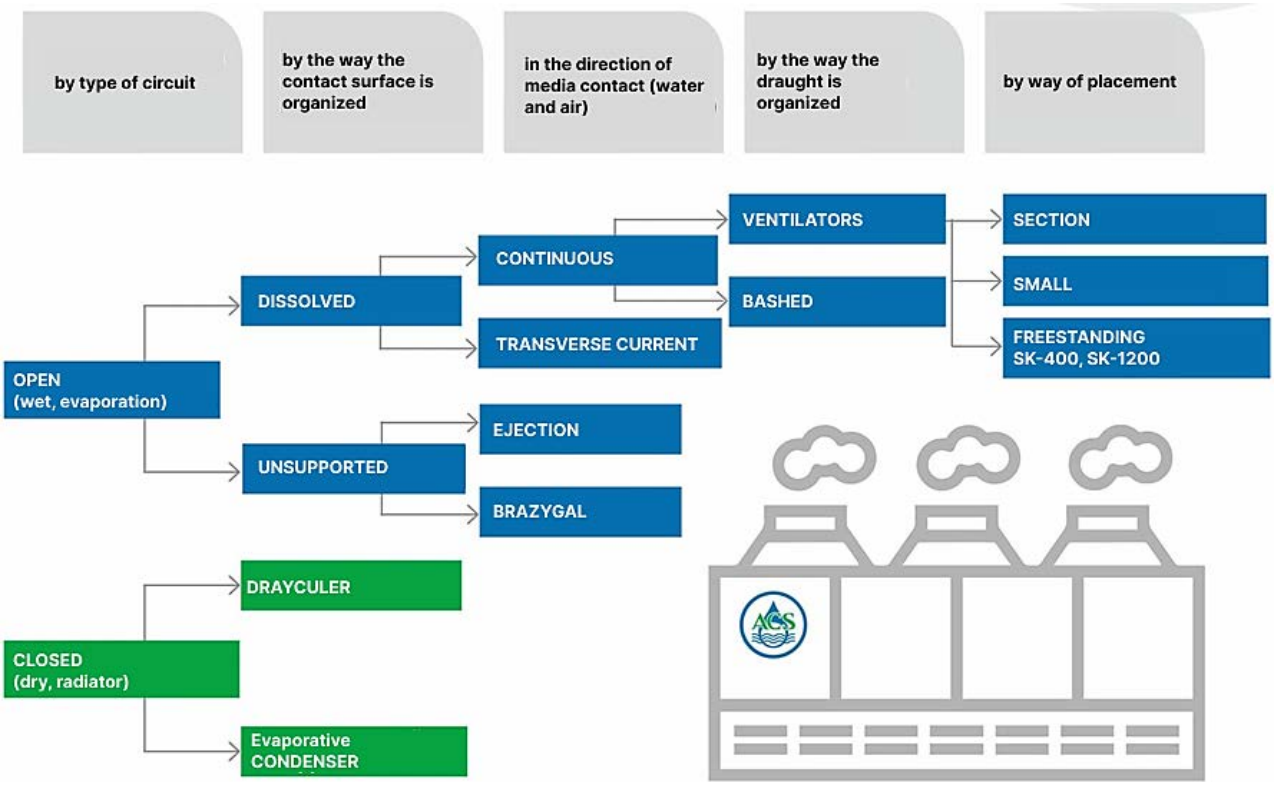


Figure 1. The classification of cooling towers

The advantages and disadvantages of various types of cooling towers are shown in table 1.

Table 1 − The comparison of cooling towers

Type Cooling towers	Fan cooling towers	Cooling towers	Crossflow cooling towers	Ejection cooling towers	Dry cooling towers
Benefits	design flexibility	no power consumption during operation	take up less space, because they can be planned "in height"	ability to cool water from high temperatures	closed circuit, no impurities in the water
	no frosting	are designed for high water flow rates	require less pressure in the water distribution system	no fan maintenance required	ability to work on boiling water
	energy efficiency			no mechanical moving parts	ability to work on ethylene glycol
	ease of repair				no dripping
	availability of a wide range of spare parts				
Disadvantages	trained maintenance personnel are required	shallow cooling depth	30% less efficient irrigator	high energy costs to create increased water pressure	low cooling efficiency
	additional measures are needed in winter	expensive construction	higher value	high drip carry	expensive construction and materials
	possibility of contamination of recycled water	sophisticated construction and repair	freeze in winter	difficulty of operation in winter	demanding maintenance and cleaning of the heat exchanger
		require special measures for the winter period	difficulty with repair, since no spare parts are produced in Russia		

Consider in more detail at the characteristics of fan cooling towers. The cooling of water in a fan tower, depending on its type, is accomplished by heat transfer to the air and by evaporation.

The design and operating principle of a fan cooling tower is quite simple. The heated water is conveyed to the water distribution unit, which is a piping system with spray nozzles. Water, flowing under pressure or gravity, is broken into small droplets of 2-3 mm in size, and distributed over the entire volume of the cooling tower, then falls on the spraying device, which has a large developed surface area. As the water passes through the sprinklers, redistribution and mixing (turbolisation) of streams takes place, resulting in an increased cooling effect [2].

At the same time, an air flow is introduced through the air intake windows against the flow of water. The heated steam-air mixture is then released into the atmosphere. The air is pumped, depending upon the type of cooling tower, by natural draft in a cooling tower, or by fans in fan-driven cooling towers. The fans can be located either at the bottom of the cooling tower (blower fans) or at the top (exhaust fans).

The cooled water is then collected and stored in a water catchment basin and conveyed to the equipment. Depending on the size of the cooling tower, the catch basin may be a concrete basin which is both the foundation of the cooling tower and a relatively small sump.

See figure 2 for an illustration of the design of the cooling tower.

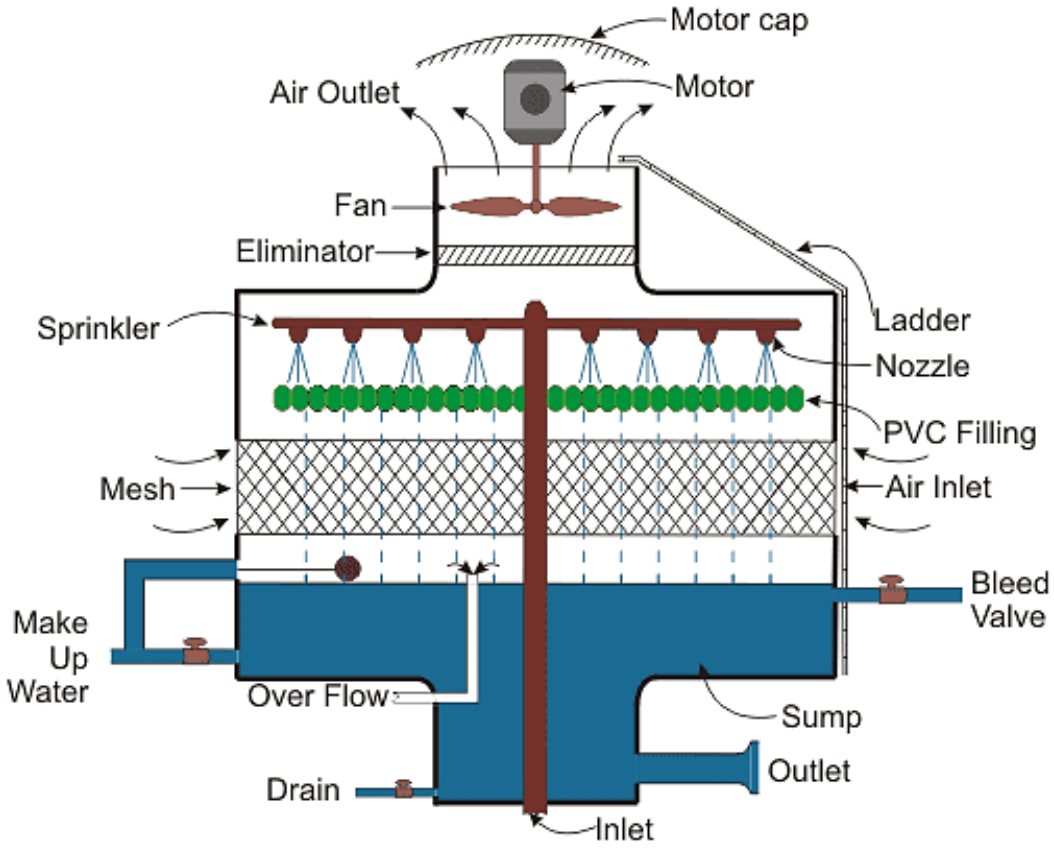


Figure 2. Fan cooling tower design

A dry cooler is a simple and robust design that includes a heat exchanger (usually finned tubes or micro-channel coils) and fans that direct airflow through the heat exchanger to cool the water or glycol solution flowing through it. Dry coolers are

generally available with either horizontal or vertical air block arrangement. The heat removal capacity is typically up to 1 MW, although higher capacity dry coolers are available on the market. The layout of the dry cooler is shown in figure 3 [3].

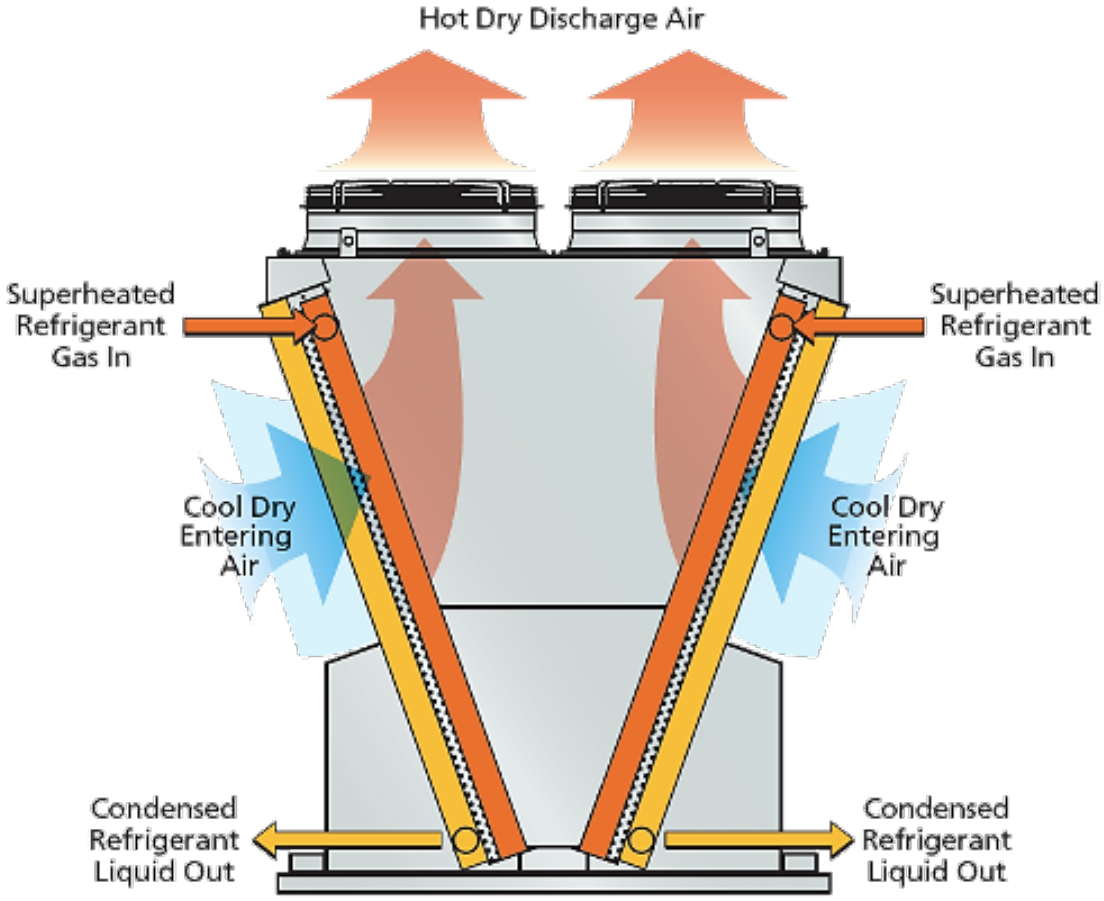


Figure 3. Design of a dry cooling tower

A wet cooling tower is a specialized heat exchanger in which the air must be in direct contact with the water to reduce its temperature. This causes a small amount of water evaporation, which lowers its temperature.

The water heated in the industrial process or in the condenser of an air conditioning unit is transported into the cooling tower through pipes. It is sprayed through nozzles onto pieces of material called "filler," which slows the flow and opens up as much surface area as possible to maximize air-water contact. The water passes through the cooling tower, there it collides with air, which is driven by a fan.

When water and air meet, a small amount of water evaporates, creating a phase transition. The cooled water is then pumped back to the condenser or process equipment, where it absorbs heat. The water then enters the cooling tower basin, after which the operation of the cooling tower is repeated. The design of the cooling tower is illustrated in figure 4.

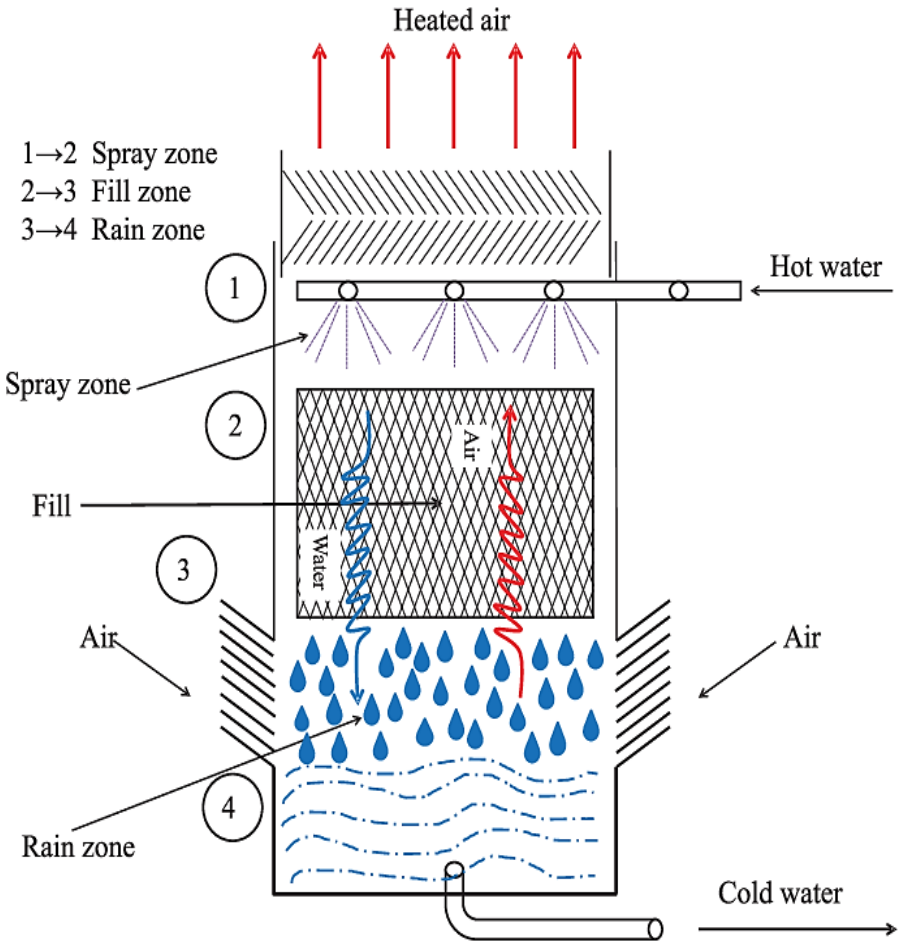


Figure 4. Design of a wet cooling tower

The crossflow cooling tower is designed with horizontal air flow and vertical water runoff. The air supply can be from one or both sides of the structure. The water flows from the top of the tank and flows under its own weight down the fill layer. Due to the large amount of incoming air, the water is converted to steam and cooled. The design of the cooling tower is shown in figure 5 [4].

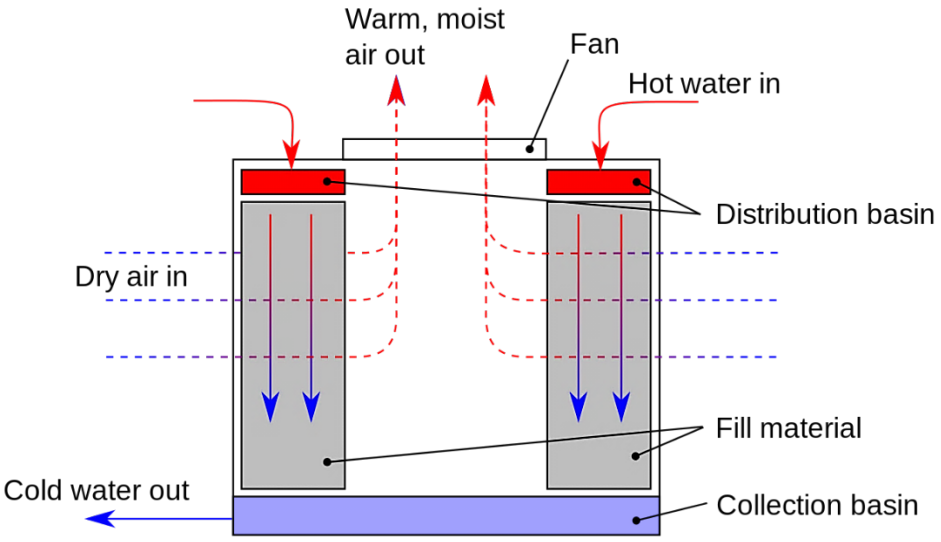


Figure 5. Design of a crossflow cooling tower

Counterflow cooling towers are cooling towers in which fluid and air flow in parallel but in opposite directions are called counterflow cooling towers. They fall into two broad types: cooling towers and fan-type cooling towers. All counterflow models have a water supply pipe, a sprinkler for spraying water and a collecting basin for the cooled liquid. The air is supplied through natural openings in the sprinkler. If the supply is in gravity mode, it is a tower design, if it is pressurized, it is a fan-driven cooling tower. See figure 6 for a cooling tower design [5].

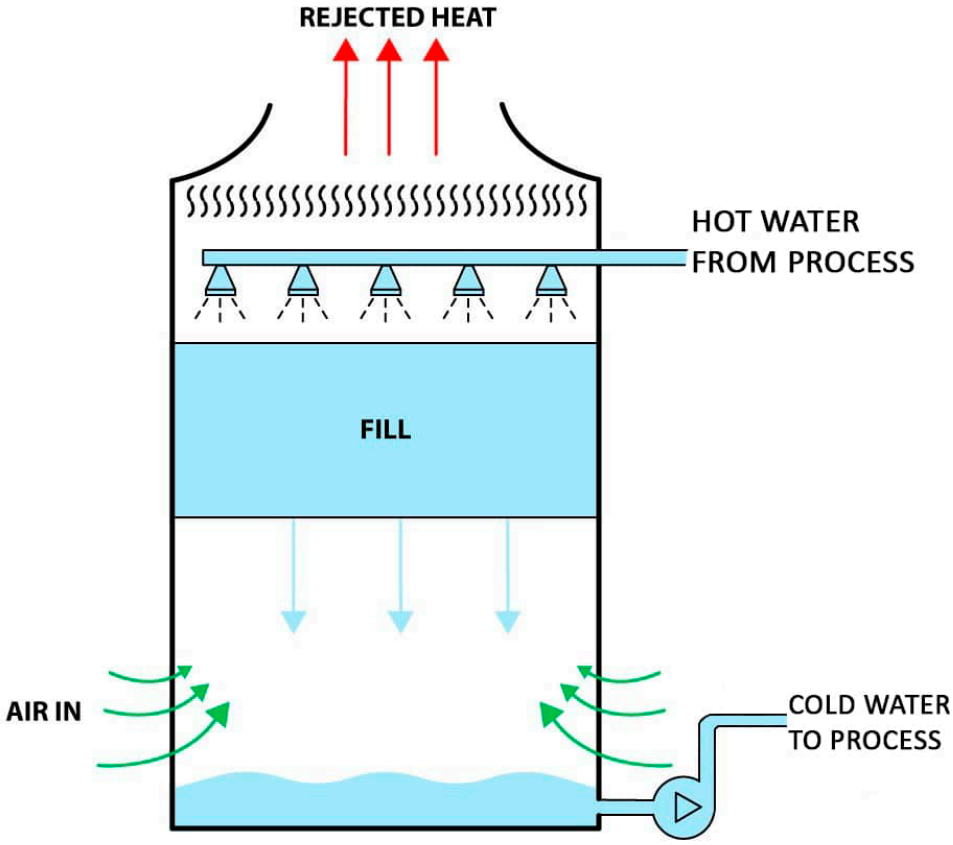


Figure 6. Design of a counterflow cooling towers

Injection cooling towers differ from other cooling towers in that they use high-pressure piping with nozzles (ejectors) to supply water to the cooling zone. Liquid is sprayed inside the cooling tower, passing through the ejectors at high pressure. Then, a pressurized air stream enters the compartment where it mixes with the water droplets.

The main advantage of a unit with ejectors is that there are no limits to the temperature of the temperature of the water before it is cooled. The pipeline nozzles are more resistant to high temperatures than conventional sprinklers that are installed in other models of water coolers. However, this design has a serious disadvantage, as a high-pressure level must be maintained at all times. The design of the cooling tower is shown in figure 7.

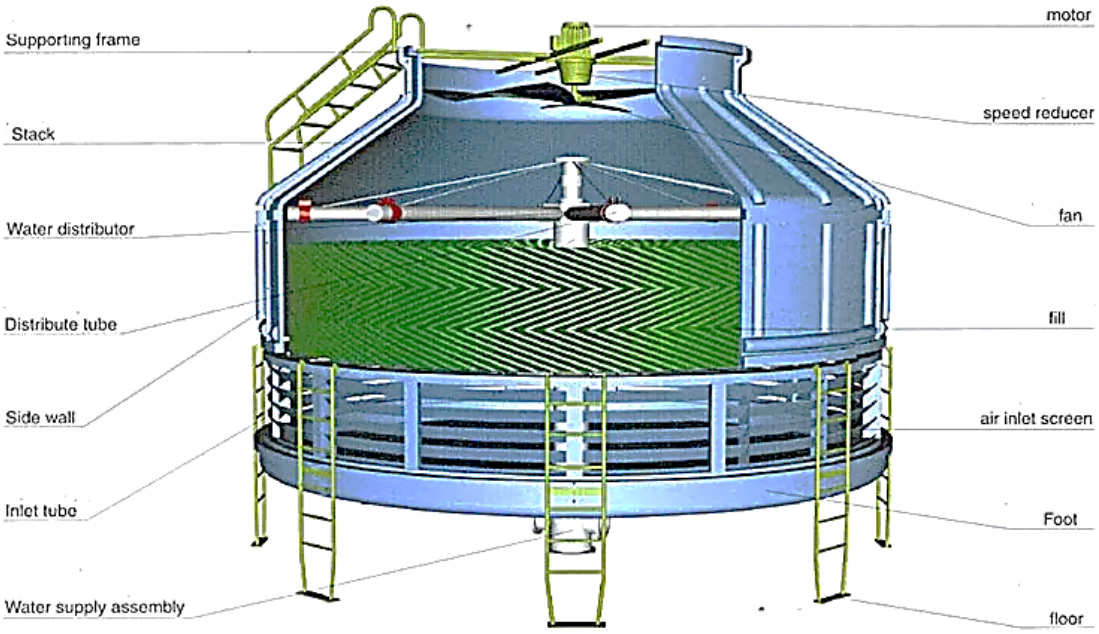


Figure 7. Design of a injection cooling tower

Inside the cooling tower is a water distribution system that evenly distributes the cooled liquid over the entire sprayed area of the unit. The water falls onto the fill layer, is broken into small particles, and is cooled by the air. The air draft in cooling tower towers is created naturally by the difference in pressure at the bottom and top of the tower. A water trap layer is installed in the cooling tower to reduce dripping. It is located above the water distribution system. Refer to Fig. 8 for the design of a cooling tower.

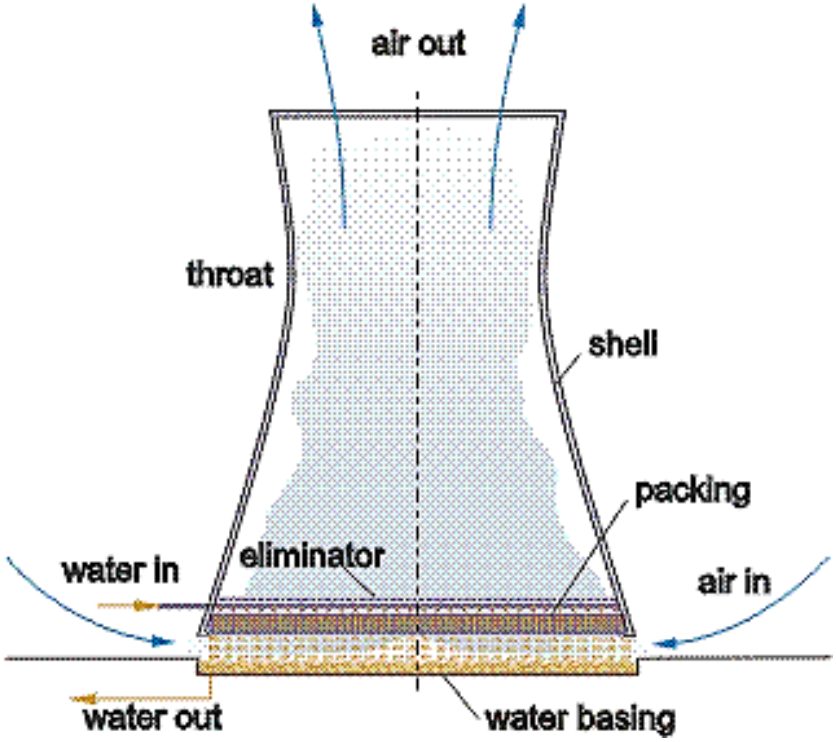


Figure 8. Design of a cooling tower

Thus, at present cooling towers are quite important constructions. The main types of cooling towers are considered, as well as their advantages, disadvantages and application of each type, their technical and economic characteristics are also compared. On the basis of the analysis of the designs of cooling towers the results showed that the most effective solution for power facilities is the use of tower cooling towers. The conducted analysis can be used when selecting a structural design of a cooling tower at power facilities.

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PROBLEMS OF USING INFORMATION AND COMMUNICATION TECHNOLOGIES IN PRIMARY SCHOOL

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Abstract. This article discusses the problems of using information and communication technologies in primary school. The author emphasizes that improper use of technology can lead to deterioration of learning outcomes and loss of opportunities for social interaction by students.

Keywords: problems, information, communication, primary school.

ПРОБЛЕМЫ ИСПОЛЬЗОВАНИЯ ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ В НАЧАЛЬНОЙ ШКОЛЕ

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Аннотация. В данной статье рассматриваются проблемы использования информационно-коммуникационных технологий в начальной школе. Автор акцентирует внимание, что неправильное использование технологий может привести к ухудшению результатов обучения и потере учащимися возможности социального взаимодействия.

Ключевые слова: проблемы, информация, коммуникация, начальная школа.

Student learning is a field with great potential to profit from information technology. After all, the dissemination of information is a fundamental force of modern technology. In addition, digital technology offers versatile platforms to optimize classroom learning. The debate about the potential harms of introducing technology to the classroom is still ongoing. After discussing the advantages and disadvantages of student access to computers and digital information, let us examine both sides. By offering digital tools and learning platforms, technology offers huge advantages in school education. Students have more information and develop technological skills. Technicians can do some activities on a par or better with teachers, including administration, data collection, and self-learning support. Here are the five main benefits of using technology in the classroom [1, p. 51].

Moderna technology is fantastic when it comes to making information accessible to everyone. Getting the latest data in the classroom will help ensure the best

educational experience possible. Teachers can also guide or guide students to reliable sources of information for accurate information. Students can also perceive information more effectively through an interactive presentation that offers digital opportunities. Instead of reading the text sequentially, the teacher or student can navigate through the information on the subject using hyperlinks, tabs, Accordions, etc. Links can be checked immediately. Classroom learning technology goes beyond paper textbooks for quick access to relevant information. The trick is to keep the focus and structure the actions to make sure the class contains the same material. The need to keep everyone on the same page, so to speak, is a limiting factor in the use of technology to obtain information. The obvious and important advantage of using technology in education is that it allows teachers to do their jobs better. In a digital testing and learning environment, automatic data collection has the following advantages: it enables the collection of more data on student performance, frees teachers from repetitive assessment exercises, and provides quick feedback to students. Platforms that provide data analytics can pinpoint areas where each student will be most challenging. Performance information allows educators to quickly adapt learning strategies and curriculum based on the data collected and analyzed. When a certain learning goal can be achieved through technology or traditional methods with about the same efficiency, a technology-based approach can only be preferred because of the benefits of data. Once in this digital environment, technology and learning content can improve over time, leaving traditional learning methods behind [2, p. 112].

The use of technology in the classroom naturally increases the ability of students to acquire technological skills. Although all but the simplest IT skills can be learned from lessons, maintaining some technical assignments is beneficial for student development. After all, we live in a digital world and have things like virtual offices and online work from home. Children learn very quickly, especially when it comes to technology. If they have the chance, they will quickly acquire computer skills and digital literacy. Examples of skills they learn include keyboard recognition, Teachers can offer students exercises that allow them to test and empower. For example, you can give students the freedom to present the results of a project. Smart people who may become IT professionals in the future will find and host online resources such as graphics or software [3, p. 23].

Students love technology, and adoption is one way to increase engagement. Combining traditional learning styles with technology reduces the predictability of lessons and makes the learning environment more dynamic. Examples of how teachers can implement the technology include orienting students to online resources, providing short videos, using interactive softare Online platforms are often flexible, which allows you to be creative. For example, you can customize quizzes to make them more interesting and competitive. Any good resource you find online can be a useful addition to the tutorial. The possibilities are endless. You can also use this technology to get more information from confidential students. If you need to get everyone's opinion on a topic or even a simple question, why not use an online survey platform?

Therefore, it also involves silent students who usually do not want to perform in class. Learning can include boring tasks such as attendance tracking, recording quiz results, and labeling completed tasks. If there is Moderna technology, then such

activities can now be partially or fully automated. This can free up time when teachers focus on teaching in the subject. However, the implementation of the technology is not without costs, and efficiency depends on good soft programmazione But over time, the work of teachers can be expected to be regulated. Teachers will have less administrative responsibilities and will have more time to harness a person's strengths, such as making connections, inspiring students, and forming a sense of common purpose. The fact that there has been so much innovation in recent times means that we are still trying to decide how to better implement technology in schools. Educators may not have the time and knowledge to effectively implement the technology. Misuse of technology can lead to worse learning outcomes and students losing the chance for social interaction. These are the main disadvantages of technology in the classroom and online education [4, p. 103].

While the lightning speed with which the technology works may seem like an obvious advantage, experienced educators are concerned about this aspect. Learning devices and apps can work faster than a person's mind can achieve an appropriate rate of learning. Students can polish the material, losing texture and depth. Correct and consistent cognitive thinking takes time. Otherwise, participation may drop dramatically. It is for this reason that experts recommend us to change the use of media, for example to slow down the video and suggest it to give us more time to reflect and reflect. Writing something by hand has a stimulating, slowing effect, which brain studies have shown to promote both learning and memory. Despite its effectiveness, typing is repetitive because pressing each key is the same action. Writing by hand is harder, more complicated and slower, which allows the brain to form more "hooks" to capture thoughts. Devices such as laptops and tablets in the classroom inevitably become sources of student attention. This is especially true if softare As for educational gadgets, appropriate restrictive measures are needed that contribute to learning goals and are not used, for example, to play games or use social media only for fun. You can be sure that some naughty students will always try to use technology for fun, not for their own purposes. The problem here is that high school students may be more tech savvy than their teachers. One method students use to access out-of-reach sites is to switch to a pro site that provides content from other sites without a technical visit to those sites. Another way to get around the school's fire fir The obvious way technology excludes social interaction is another cause for concern. When using technology, students do not have to communicate and interact verbally with their teachers and with each other. Online learning completely eliminates face-to-face interaction. To solve this problem, class leaders must ensure that activities such as oral presentations, recitations, and teamwork take place regularly. We must remember that we are trying to prepare well-rounded developed individuals for adulthood. For students addicted to games or social media, school can be a place to take a break from technology. Teachers need to determine if students spend too much time on devices. When technology is not used, students should be encouraged or forced to be active and interact [5, p. 60].

Although technology can make a teacher's job easier in the future, we have not succeeded yet. Developing effective lessons using digital technology, rather than traditional methods, is a challenging and time-consuming task. That is why it is important for teachers to share their ideas on how to effectively educate children when

technology is in the classroom. Staying in the classroom and teaching through communication and communication with students does not require special training. But when the technology is widely used during classes, you need to prepare. Teachers who take advantage of technology get the same time for face-to-face learning, but they may need more planning, which puts a strain on their workload. When classes were held at a distance, online learning showed that technology was limited. Trying to corner students, making sure everyone comes in and pays attention to them is not an easy task in and of itself. The quality of lessons suffers because educators struggle with technology to meet students ' hands-on learning needs.

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