

Oles Honchar Dnipro National University
Faculty of Ukrainian and Foreign Philology and Study of Arts
Department of English Language for Non-Philological Specialities

**MODERN SCIENTIFIC AND TECHNICAL RESEARCH IN
THE CONTEXT OF LINGUISTIC SPACE (IN ENGLISH)**

*Conference materials
of the III All-Ukrainian scientific and practical conference
of young scholars and students*

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The collection of conference materials includes academic works of the III All-Ukrainian scientific and practical conference of young scholars and students "Modern Scientific and Technical Research in the Context of Linguistic Space (in English)" on natural, humanitarian, socio-economic, engineering and technical studies and the latest information technologies.

For students, post-graduates, teachers of higher educational establishments and scholars.

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**WELCOMING SPEECH TO THE PARTICIPANTS
OF THE III ALL-UKRAINIAN SCIENTIFIC AND PRACTICAL
CONFERENCE OF YOUNG SCHOLARS AND STUDENTS
“MODERN SCIENTIFIC AND TECHNICAL RESEARCH IN
THE CONTEXT OF LINGUISTIC SPACE (IN ENGLISH)”**



Dear participants of the III All-Ukrainian Scientific and Practical Conference of Young Scholars and Students “Modern Scientific and Technical Research in the Context of Linguistic Space (in English)”!

English as a global language serves as a bridge connecting and uniting people from diverse cultures. Nowadays, the ability to communicate effectively in English is a necessary skill, which provides access to educational, professional, and cultural opportunities. This conference serves as a specific platform for us to enhance our understanding of the complex relationship between language and science, and to engage in fruitful discourse and knowledge exchange.

I am delighted to welcome every one of you to this conference. I am filled with a great pride and excitement, as I observe the gathering of so many bright and

talented academicians and students who are eager to exchange ideas and delve into the latest developments in their respective fields.

I would like to emphasize on the significant participation and geographical diversity represented at this year's event. Graduates and postgraduates from various regions including Ukraine (Dnipro, Lviv, Kyiv, Lutsk), Poland (Krakow), and Germany (Mittenwald) have presented their academic research findings across a wide spectrum of disciplines ranging from natural sciences, humanities, and social sciences to economics, engineering, technical sciences, and the latest information technologies.

I believe that this conference will prove to be intellectually stimulating and rewarding for all attendees. Your contributions to this conference play a crucial role in shaping the direction of research, not just in Ukraine but worldwide, as future leaders in academia. I encourage you to seize this opportunity to challenge yourselves, to engage in critical thinking, and to explore new frontiers within your spheres of interest.

I wish all the participants and the conference organisers a successful, productive conference. I also extend my best wishes for a fruitful and enjoyable experience. May this conference serve as a stimulus for further academic growth, and may your efforts result in significant outcomes that contribute to the progress of knowledge and our society.

Together we are a force! Together, each in our place, we speed up our Victory!

Iryna Popova,
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Oles Honchar Dnipro National University

**WELCOMING SPEECH TO THE PARTICIPANTS
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“MODERN SCIENTIFIC AND TECHNICAL RESEARCH IN
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Dear conference participants!

I welcome all of you to the III All-Ukrainian scientific and practical conference of young scholars and students “Modern scientific and technical research in the context of linguistic space (in English)”.

For the third time, the lecturers of the Department of English Language for Non-Philological Specialities are engaging graduates, postgraduates, and young scholars from various faculties not only from our university, but also from other leading institutions of higher education of our country. I believe that this is a very important unifying factor at such a difficult time for Ukraine. The academic conference opens opportunities for discussion, exchange of opinions, search for non-standard solutions etc.

As young scholars you have a wide access to a variety of resources that can help you in your research and academic endeavors. Working closely with experienced lecturers and experts, young scholars can gain valuable information and guidance for their research and academic careers. Such conferences, regular meetings and academic events promote mentorship and collaborative opportunities, allowing young researchers to be connected with the colleagues and exchange ideas, as well as to count on their assistance and support.

It is important to encourage young scholars to pursue research and academic careers, and the annual academic conference demonstrates the conscientious and meticulous work of the Department of English Language for Non-Philological Specialities, with the aim of providing opportunities and support to continue academic work. By participating in such conferences, young scholars can share their research results, receive valuable feedback, and communicate with other scholars both in their and complementary fields.

Within the framework of the III All-Ukrainian scientific and practical conference of young scholars and students “Modern scientific and technical research in the context of linguistic space (in English)”, the operation of four sections is planned, in which the following main issues are to be discussed: 1) the latest studies in the field of natural sciences; 2) current problems of social sciences and humanities; 3) modern research in the field of socio-economic sciences and information technologies; 4) topical issues of engineering and technical sciences and the latest information technologies.

I sincerely wish the participants of the conference and its organizers inspiration, constructive work, a peaceful sky, and Victory!

PANEL 1

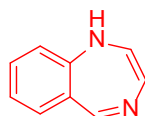
Modern Studies in the Sphere of Natural Sciences

(DNU, Zoom)

A. Bershak, O. Hurko

EVOLUTION OF THE SYNTHESIS AND CHEMICAL MODIFICATION OF 1,4-BENZODIAZEPINES FROM THE FIRST COMPONENTS TO MODERN DERIVATIVES

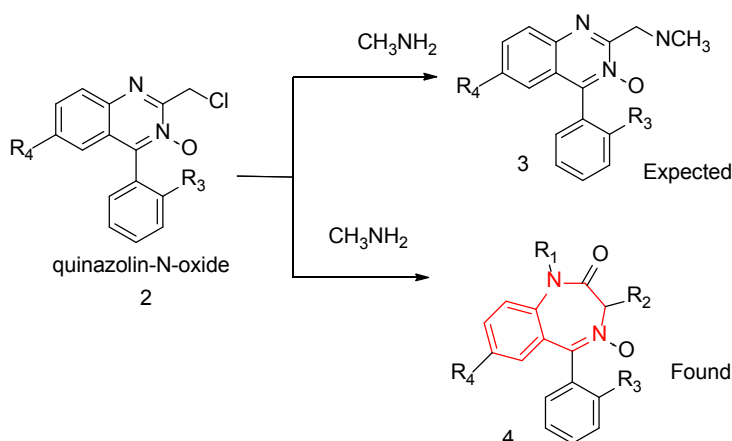
1,4-Benzodiazepines (1) are a structural class of compounds that have a wide spectrum of biological activity and are used as pharmaceuticals.



benzo[e][1,4]diazepine

(1)

The first representatives of a series of benzodiazepines were known since 1957 of the last century, when the chemist Leo Sternbach and his research group working in the Hoffmann-La Roche laboratories in Nutley, New Jersey tried to find new tranquilizers, but due to limited knowledge of the processes occurring in a brain, they used an empirical approach: they looked for a new class of drugs, guided purely by modifications of known structures. By introducing into the reaction nucleophilic substitution 2-(chloromethyl)-6-R-4-arylquinazolin-3-oxides (2) instead of the expected [2-((methylamino)methyl)-6-R-4-arylquinazolin-3-oxides (3) the first benzodiazepines (4) (BZD), in particular chlordiazepoxide [3-6, p. 4].

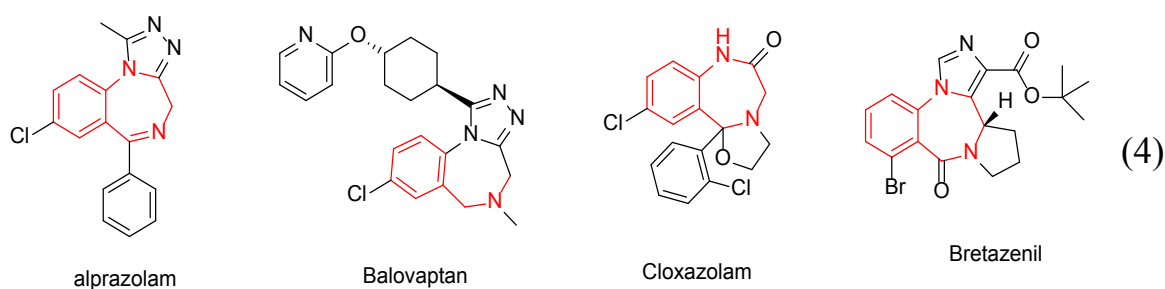


In the 70s of the last century, benzodiazepines, as tranquilizers, became one of the most frequently prescribed drugs in the world, despite the rapid detection of potential addiction and abuse. Over time, risks associated with the use of benzodiazepines, such as the potential for physical and psychological dependence, were identified, so in 1975 the Food and Drug Administration (FDA) placed benzodiazepines on the list of restricted drugs. The final confirmation of addiction to these drugs was established only in the 1980s, after a series of clinical trials and numerous statements from both patients and doctors. Despite recommendations for treatment with a number of benzodiazepine drugs lasting no more than 4 weeks, many doctors continued to prescribe them for months or even years. The use of benzodiazepine tranquilizers has gradually declined since the mid-1980s due to increasing public awareness of the consequences of uncontrolled use and the discovery of other anxiety medications, such as selective serotonin reuptake inhibitors (SSRIs), which have been shown to be safer and more effective than benzodiazepines. As an alternative to benzodiazepine drugs, non-benzodiazepine receptor agonists, also known as Z-drugs, were introduced in the 1990s as an alternative for the treatment of insomnia such as zolpidem, zopiclone and zaleplon. In the period from 1999, there was an increase in the general use of benzodiazepines, mainly due to a rise in the number of people who illegally use them [2, p. 2].

People who intentionally abuse BZDs usually have problems with other substance abuse. Benzodiazepines, usually secondary drugs of abuse, are used primarily to enhance the euphoria derived from another substance or to offset the side effects of other drugs. Few cases of addiction stem from the legal use of benzodiazepines. On August 31, 2016, the FDA issued a drug safety communication regarding serious risks, including death, when opioid anti-inflammatory drugs are combined with benzodiazepines. The safety communication warned that "healthcare workers should limit the prescription of opioid drugs with benzodiazepines, except to patients for whom alternative treatment methods are insufficient" [22-23, p. 1].

Benzodiazepine-induced pharmacologic dependence, which usually manifests itself in withdrawal symptoms when treatment is abruptly discontinued, can occur even as a result of legitimate use. This reaction, caused by the constant effect of the drug after a long time, can be avoided, for example, by gradually reducing the dose and/or changing the drug [16, p. 3].

At the present stage, among medically important condensed benzo[e][1,4]diazepines, the most famous are triazolodiazepines (anidazolam, alprazolam, balovaptan), imidazodiazepines (bretazenil, climazolam, flumazenil), oxazolobenzodiazepines (cloxazolam, futazolam, haloxazolam). These compounds, as well as non-condensed analogues, mainly have a neurotropic effect and are used as anxiolytic, sedative, anticonvulsant and antidepressant agents. At the same time, a number of condensed benzo[e][1,4]diazepines have pharmacological effects unrelated to effects on the nervous system. Thus, the antibiotic anthramycin, which belongs to pyrrolobenzodiazepines, has a pronounced anticancer effect concerning some cancer cell lines.



Over the past decade, significant progress has been made in the development of methods for the synthesis of both substituted and fused benzo[e][1,4]diazepines. The problems of the synthesis of new representatives of a series of 1,4-benzodiazepines are devoted to the works of the authors [1-4]. For the synthesis of functionalized benzodiazepines, reactions of a number of diamines (1,4-binucleophiles) are most often used, with a library of carbonyl-containing substrates using various types of catalysis and reaction conditions. One of the promising types of 1,5-binucleophilic reagents that can be used for the synthesis of condensed benzo[e][1,4]diazepines are 2-azolyl-(aziny)anilines, which were previously described as objects of modifications aimed at the synthesis of -condensed quinazolines. In the course of the dissertation research, we are developing methods for the formation of benzo[f][1,2,4]-triazino[2,3-d][1,4]diazepines and benzo[f][1,2,4]triazolo[1,5-d][1,4]diazepines by the interaction of 2-(3-phenyl-1H-1,2,4-triazol-5-yl)anilines and 3-(2-aminophenyl)-6-R-1,2,4-triazin-5(2H)-ones with 1,2-bielectrophiles.

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K. Boichenko, Yu. Matsuk, O. Posudiiievskia

ANALYSIS OF THE ASSORTMENT AND IMPROVEMENT OF THE ICED TEA TECHNOLOGY

It is well-known that tea is a beverage obtained by immersing young leaves and buds of a plant into freshly boiled water. The main types of tea are black, green, white, and oolong. Each of them has its own unique flavor and characteristics which depend on the origin of the leaves and processing methods, in particular, the operation of fermentation, resulting in either fermented (black tea), or unfermented (green and white tea), or semi-fermented (oolong tea) [2].

Iced tea is a refreshing and culturally significant beverage that people have enjoyed for centuries. No matter what type of tea a consumer prefers, one can't dispute about the attractiveness of a glass of iced tea on a hot summer day.

In addition to its cultural significance, iced tea has also been the subject of many interesting health studies. Some studies show that drinking tea, both hot and iced, can have a positive effect on heart health, while others suggest that tea can help strengthen the immune system and prevent certain types of cancer. Of course, it is important to note that these studies are still ongoing and more research is needed to fully understand the health benefits of tea [1].

Today, iced tea is enjoyed by people all over the world, and different cultures attach their own meaning to this drink. Currently, there are several types of iced tea on the market. The main purpose of such a drink is that it can "chill" in hot weather. This tea is in demand, because it is quite tasty and not very expensive.

Iced tea contains tea extract, and, therefore, a certain amount of nutrients. On the other hand, iced tea often "sins" on the presence of additives. Iced tea can be hazardous to health, as there is a risk of kidney stones due to the oxalate, a chemical that is concentrated in the frozen tea.

Companies that produce tea: “Svoya Linia”, “Biola”, “Lipton”, “Fuzetea”, “Nestea”. But despite the large number of manufacturers of this product, the number of flavors is quite limited.

The following assortment of tea was analyzed and determined:

Producer “Svoya Linia”: black tea with lemon flavor, black tea with raspberry flavor, green tea with mango and passion fruit flavor.

Manufacturer “Biola”: black tea with lemon flavor, black tea with peach flavor, black tea with plum and cannabis flavor, raspberry tea, green sauced tea, pomegranate hibiscus tea.

Manufacturer “Lipton”: lemon-flavored iced tea, blueberry-flavored iced tea, peach-flavored iced tea, green iced tea.

Manufacturer “Fuzetea”: black tea with wild berry flavor, green tea with chamomile and mango flavor, black tea with peach and rose flavor.

Producer “Nestea”: black tea with peach flavor, black tea with lemon flavor, black tea with mango and pineapple flavor, green tea with strawberry and aloe flavor.

The purpose of the work is to analyze the existing assortment of iced tea, improve its composition and add new flavors, such as orange, apple, grape, pineapple, cherry, sea buckthorn, mint etc.

The advantage is that the above-mentioned fruits have a large number of beneficial properties. Thus, in addition to the emergence of new flavors, there will also be an advantage over other kinds of tea in terms of technological properties.

The **object** of research is the technology of producing iced tea for functional purposes.

The **subject** of research is iced tea, traditional recipe ingredients and freeze-dried fruit.

The **purpose** of this work is to develop a technology for functional iced tea and to improve the taste and quality of iced tea.

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2. Top 10 health benefits of tea. *goodFOOD*: URL: <https://www.bbcgoodfood.com/howto/guide/top-10-health-benefits-of-tea> (date of application: 10.03.2024).

ANALYSIS OF DESSERT TECHNOLOGIES AND EXTENSION OF THEIR RANGE

The analysis of dessert production technologies and extension of their range is a relevant topic for the modern food industry. The constant development of society and changes in consumer preferences stimulate manufacturers to search for new ways to improve products, including the field of desserts.

One of the main development strategies in this area is the analysis of existing dessert production technologies. The study of production processes, as well as of the use of raw materials, and technological chains allows us to identify potential opportunities for improvement and optimization. For example, the use of new ingredients or modification of existing ones can improve product quality or reduce production costs.

In order to conduct a technology analysis, various aspects should be considered, such as technological processes, requirements for raw materials, the use of equipment and energy resources, as well as the analysis of market trends and consumer preferences. This will help to realize the strengths and weaknesses of existing technologies and find gaps that can be filled [1].

One of the courses of development is the extension of the dessert range. Considering the growing demand for exotic flavors and non-standard ingredients, it is important to look for new recipes and technologies in order to produce such products. For example, the research may focus on creating desserts using local exotic fruits or on producing desserts with reduced sugar content or artificial additives.

Significant attention should also be paid to the analysis of trends in the consumer market. Taking into account changes in consumer preferences, it is possible to determine the potential demand for new types of desserts and adapt production to these needs. For example, the growing interest in a healthy lifestyle may lead to the creation of desserts with reduced calorie content or the production of gluten-free variants.

In the context of extending the range of desserts, it is also important to consider the aspects of sustainable development and environmental safety. The use of natural, organic ingredients, as well as the optimization of technological

processes with the minimization of waste and energy consumption will allow us not only to satisfy consumer demand, but also to reduce the negative impact on the environment [1].

Thus, the analysis of dessert production technologies and the extension of their range is a difficult, but very promising task in the field of food industry. By studying innovative approaches, analyzing market trends and consumer preferences, it is possible not only to improve the quality of products, but also to extend their range, taking into account modern requirements for sustainable development. In addition, it is worth paying attention to technological innovations that can influence the production of desserts. For example, the use of the latest methods of managing the production process, such as automation and the introduction of the Internet of things, can significantly increase production efficiency, reduce labor costs and shorten the production time.

Along with that, the research of new conservation and packaging methods can improve the storage and transportation of desserts, by increasing their shelf life and ensuring product safety during its delivery to the consumer.

Considerable attention should also be paid to the analysis of product quality and safety requirements. Taking into account the growing awareness of consumers for food safety and product quality, manufacturers must constantly improve technological processes in order to prevent possible risks of contamination or quality violation [2].

In addition, it is important to consider trends in consumer behavior and healthy lifestyle. The growing popularity of vegan and gluten-free diets, for example, may require from manufacturers the development of new dessert recipes that meet such demands.

It is also necessary to take into account the regulation and normative requirements that relate to the production of food products. Ensuring compliance with safety and quality standards, as well as fulfillment of the requirements concerning labeling and informing consumers, are key aspects of dessert production.

Therefore, the analysis of dessert production technologies and the extension of their range are a complex and multifaceted task which requires a comprehensive approach and constant improvement. By combining innovative technologies, considering the requirements of the market and consumers, as well as complying with regulatory requirements, it becomes possible to achieve success in this field and to meet the needs of the modern consumer.

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ELECTRON AVALANCHE IN A RADIO-FREQUENCY PLASMA TORCH

High Frequency Solid State Tesla Coil (HFSSTC), a.k.a. radio-frequency plasma torch is an atmospheric pressure plasma source that relies on high frequency oscillation of a resonator circuit to obtain a stable plasma flame. Unlike the vast majority of alternative methods, this type of circuit has only one electrode, emitting electrons into the surrounding atmosphere and causing ionization of neutral gas. The typical frequency range of the oscillator is 10MHz [1]. The ion temperature is observed to be several thousand °C. Although the mentioned device has a potential to serve a wide variety of practical applications as a stable cold plasma source ($T_i \ll T_e$) with an unshielded cross-section from one side, it remains a relatively little discovered phenomenon. This paper provides an overview of the electron avalanche effect taking place in the single electrode flame discharge.

At the moment of plasma flame initiation, a beam of electrons is emitted from a metal electrode surface. The charge propagates through the surrounding gas as a series of ionizing collisions. The electron avalanche current force equates to [2]:

$$I = \frac{I_0 e^{\alpha x}}{1 - \gamma e^{\alpha x}}$$

Where $I_0 \sim n_0$ is current of initially free charged particles. However, unlike the two-electrode arc discharge, plasma torch does not facilitate the secondary electron emission due to the absence of cathode. Hence, the formula is rewritten as:

$$I = I_0 e^{\alpha x}$$

Current growth exponentially until all free-charged particles, triggered by cosmic radiation and other sources, have dissipated [2]. While in a traditional arc

they reach the cathode, under the conditions of a high frequency solid state tesla coil discharge, the particles undergo the process of recombination with gaseous molecules. The plasma body, produced by a stable plasma source, is expected to exist in the atmosphere for a timeframe $t \gg 1/\omega_p$, where ω_p is plasma frequency, described as:

$$\omega_p = \sqrt{\frac{n_e e^2}{m_e \epsilon_0}}$$

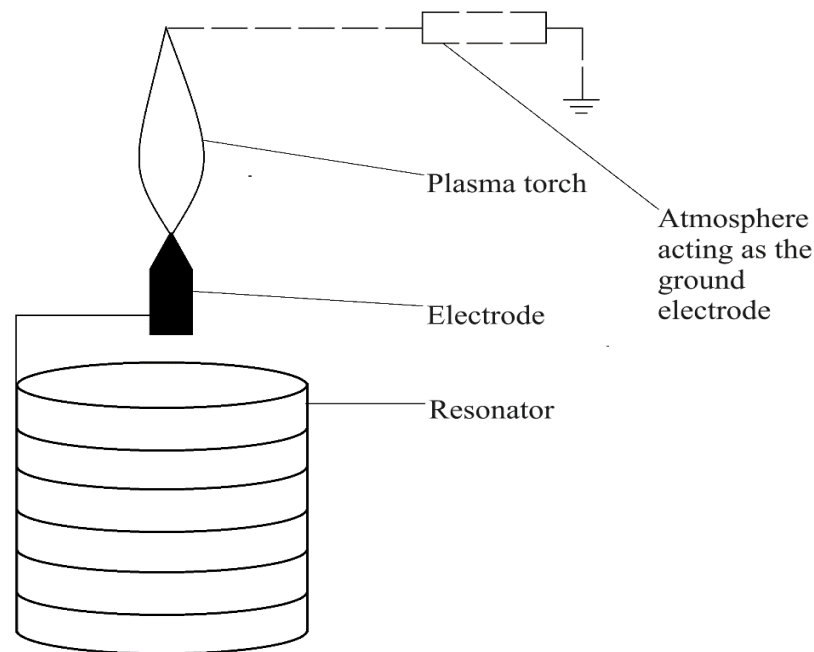


Fig. 1. Plasma flame generator

Thus, every electric pulse triggers a new formation of electron avalanche with initial current I_0 formed by not yet dispersed particles after the previous pulse. The principle of electron avalanche is sufficient for describing two observed peculiarities of the radio-frequency torch:

1. Plasma flame does not have a clear breakdown voltage value; instead, its size increases with the increase in voltage.
2. For the initiation of the torch a metal conductor is used as the ground electrode (although it is not required to be grounded, since its capacitance is sufficient). It supports the suggestion that the frequency of the resonator is higher than the plasma oscillation frequency, due to the number of free electrons formed by background radiation being less than between pulses.

The non-obstructed cross-section of the plasma body offers many advantages compared to more traditional discharges. However, since the operation of the device greatly relies on the pressure of the surrounding gas, it is not suitable for a low-pressure environment [3]. In conclusion, the radio-frequency plasma torch poses a great interest for both theoretical and practical research. Although the electronic circuit designs of such devices are well-known and diverse, the physical explanation of the process is still not fully developed. The mentioned plasma source also has many potential applications, including surface treatment, ignition, and energy transfer.

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NON-USEFUL PROPERTIES OF "USEFUL" ALUMINUM

The following facts are well-known about aluminum: it is an element of the IIIA group of the Periodic Table; it is the most abundant metal and the third most abundant element in the Earth's crust; its characteristic oxidation state is +3.

Aluminum is the most versatile and widely used metal on the planet. It is the material № 1 in aircraft construction, food industry, and the production of tableware. This success is due to the fact that it is easily separated from its ores, is resistant to corrosion and has high thermal and electrical conductivity; has a low density and is extremely plastic, as well as perfectly amenable to pressure treatment in the cold state. However, the efficiency of extraction and utilization of this metal by the aluminum industry does not align with the geochemical cyclicity of aluminum, as nearly half of it constitutes non-recyclable waste, which imposes a significant burden on landfills. The decomposition period of aluminum cans exceeds 200 years.

Therefore, there is an urgent need to understand how to live safely and efficiently with aluminum. There is an opinion that aluminum is a "safe" metal which does not have any particular negative effects on human health. However, in

reality, the assumed "safety" of aluminum is just a successful marketing ploy. In reality, aluminum is an immunotoxic bioelement with a mutagenic effect, capable of accumulating in the human body. It is known that aluminum is a cause of dialysis encephalopathy and contributes to the development of Alzheimer's disease. Depending on the concentration, aluminum has an inhibitory or activating effect on digestive enzymes; it blocks the active centers of enzymes involved in hematopoiesis, affects metabolism (especially mineral), participates in the regulation of nervous system functions, reveals the competing action of P, Ca and Fe, affects cell reproduction and growth, as well as reproductive capacity, embryonic and post-embryonic development [1, p. 73].

As is known, each of the external surfaces of the human body (skin, nose, lungs, and gastrointestinal tract) can serve as a route for aluminum entry into the body, promoting its absorption and subsequent systemic accumulation. In this way, they become targets themselves for the biological activity, and thus, the toxicity of aluminum. In the human body, aluminum is concentrated in bones, liver, lungs, and gray matter of the human brain. The sources of aluminum intake by the body are air, drinking water (the main source of intake), food, medicines, cosmetics and perfumes. It can also enter the body from aluminum dishes and aluminum foil, because it penetrates into the food during hot processing of food products or baking bread. The average aluminum content is 61 mg per 1 kg of body weight, and the daily requirement is 35–49 mg.

Therefore, a question arises if we should be afraid of aluminum. In order to understand to the full extent, or at least estimate, the effects of aluminum on humans and its importance to human health, two aspects must be taken into account. The first is that no organism needs aluminum to complete its life cycle. The second is that aluminum is not apparently toxic to humans. The biggest harm from aluminum is that it is poorly excreted. It is capable of accumulating and triggering negative processes in the body, which manifest themselves in the form of various diseases. In this way aluminum reveals its hidden toxic effect [2].

Summing up, we should point out that the issue of the effect of aluminum on the human body has not been investigated thoroughly and requires further scientific research. It is necessary to determine the specific biological role of aluminum, to find out whether certain physiological systems may be more susceptible to aluminum "attack" than others, as well as to understand the nature of any increased vulnerability.

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THE USE OF ALBUVIR TO PRODUCE A LIFE-SUSTAINING YOUNG CRAYFISH

Marbled crayfish or Marmorkrebs (*Procambarus virginalis*) is a perspective species in aquaculture and water areas because a single individual is only needed to establish a new population, and they can reproduce asexually. Therefore, it is important to clarify the biological aspects of its breeding and the influence of biological additives «Albuvir» on the young generation's vitality. Albuvir is a broad-spectrum antiviral agent. The drug is a composition of acidic peptides capable of self-organization and self-adaptation in the body. Their mechanism is based on the blockade of nuclear import peptides and prevents import from the viral genome from crossing the nuclear membrane. An interesting detail is that adaptation to the drug is impossible for the virus and for the animal organism because the drug is a quasi-living self-organizing system and its composite pharmacophore is unique for each animal and virus. Marbled crayfish is reproduced by means of parthenogenesis – an asexual reproduction in which a female can produce an embryo without fertilizing an egg with sperm. As a result, their offspring is genetically identical, which makes this species the best research object.

To determine the most optimal conditions for marbled crayfish breeding, a number of experiments were carried out and the following results were obtained:

4. The water temperature in the tank is 21° C.
5. The water is changed of necessity but at least once a week.
6. The compressor maintains oxygen supply in the water.
7. Decorative water plants, including plastic ones, must not be placed into the tanks as crayfish are very active and can eat them up.
8. The feeding of the species is carried out once a day. The amount of food should equal 5% of the total mass of the population.

9. The bioactive additive «Albuvir» in the dose of 0,01% of the tank's volume is added once a week.

Based on the experiments, the following conclusions have been made:

1. the mass of the experimental group has increased by 4,6 times in comparison with the control group within 10 weeks;

2. following the recommended ways of rearing, the rate of hatched offspring amounts to 90%-95%, whereas in the wild their population reaches 50% due to cannibalism;

3. the breeding population in the experimental group is 20 % higher than that in the control group;

4. «Albuvir» can be used not only as a medicine for fowl but also as a food supplement for hydrobionts.

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K. Kibalnik, Yu. Matsuk, O. Posudiiivska

STUDY OF THE USE OF PUMPKIN FLOUR IN LEMON TART DOUGH IN ORDER TO INCREASE ITS BIOLOGICAL VALUE

Current trends in nutrition show a growing interest in healthy lifestyles and proper nutrition. Under the influence of these trends, consumers are paying attention more often not only to the taste of products, but also to their health benefits.

This study is devoted to the study of the biological properties of pumpkin flour and its use in lemon tart dough in order to increase its biological value and create a healthier and more wholesome dessert.

Pumpkin flour, due to its nutritional composition, is an excellent alternative to wheat flour for creating the base of tart dough. Due to its high content of protein, fiber, fats and vitamins, as well as minerals, such as calcium, magnesium, potassium

and others, pumpkin flour helps to increase the biological value of the dish. It enriches the dough with nutrients and makes the lemon tart even more delicious and nutritious.

Pumpkin flour has a wide range of beneficial properties, including anti-allergic, immune-stimulating, tonic, anti-cancer, bactericidal, anti-inflammatory and anti-parasitic effects. It is a significant source of complete and easily digestible vegetable protein containing many essential and non-essential amino acids necessary for maintaining a strong immune system and healthy body functions. Pumpkin flour also speeds up metabolism, stabilizes blood sugar levels and helps to prevent diabetes.

Fruit or vegetable flour is added to dishes at the amount of 5-20%, thus replacing a part of the recipe component of the dish with such flour. This results in the reduction of the calorie content of food and increase in its biological value. The addition of fruit and vegetable flour to culinary products and dishes will encourage the development of a significant number of new recipes [1].

Thus, based on the analysis, it can be determined that pumpkin flour has the advantages for use in tart dough. It not only enriches the dish with nutrients, but also improves its taste and nutritional value, making it more attractive to consumers.

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D. Kyrylova, S. Okovytyy

SEARCH FOR NEW EGFR INHIBITORS AMONG SUBSTITUTED PTERIDINE DERIVATIVES AS POTENTIAL ANTITUMOR AGENTS USING AFFINITY CALCULATIONS

Among the promising low-molecular-weight anticancer agents there is a group of heterocyclic compounds that contain a wide variety of substitutions with diverse biological roles. The compounds based on pteridine have been reported to perform various biological actions, such as anti-inflammatory activity and analgesic effect, as well as to play a potent role as inhibitors of the hepatitis virus,

immunosuppressive effect, and anti-nematode activity, glyoxylase inhibitory and antimicrobial activity [1].

J. Lin *et al.* synthesized a series of novel EGFR T790M mutant-targeted inhibitors and analyzed the binding model of 6,7-dioxo-6,7-dihydropyridine scaffold and its hydrophobic modifications at N5-position. Among the group of analyzed compounds, the most representative compound with the 5-isopropyl group at N-5 moiety was identified [2].

Thus, a series of 6,7-disubstituted-2-oxo-(imino-, thioxo-)-2,3-dihydropyridine-4(1H)-ones (**1-19**) has been selected and studied on biological targets. The results of the affinity calculations of the compounds were compared with the results of the previously calculated data by W. Zhou *et al* [3] for EGFR T790M (PDB code 3IKA)-bioactive WZ4002 compound (Table 1). The results show that the compound **8** has the highest affinity for EGFR T790M. Introduction of F- to the heterocyclic fragments (**1, 2, 8**) to *para*- and *ortho*-positions of the benzene ring leads to a significant increase in their affinity for the corresponding protein indicating the need for further investigation of these compounds concerning their physicochemical properties.

Table 1. Affinity of compounds 1-19 to binding sites of EGFR T790M (3IKA), kcal/mol

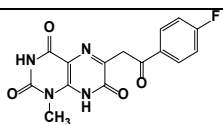
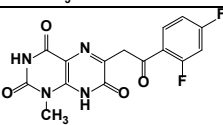
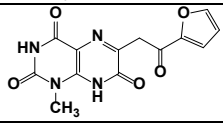
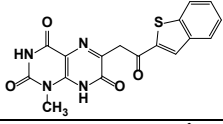
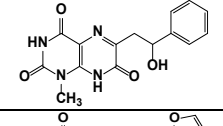
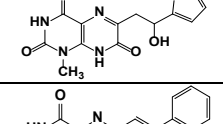
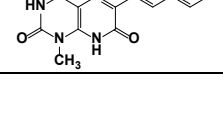
Compound	Code	Structure	Affinity (kcal/mol) for EGFR T790M, PDB ID – 3IKA
1	1K-29		-7.8
2	1K-31		-7.6
3	1K-121		-7.0
4	1K-123		-7.5
5	1K-194		-7.1
6	1K-195		-7.0
7	1K-97		-7.3

Table 1 (continuation)

Compound	Code	Structure	Affinity (kcal/mol) for EGFR T790M, PDB ID – 3IKA
8	1K-96		-8.3
9	1K-90		-7.7
10	1K-88		-7.6
11	1K-80		-7.8
12	1K-61B		-7.8
13	1K-61A		-7.7
14	1K-45		-7.2
15	1K-49		-6.0
16	1K-33		-5.9
17	1K-24		-7.6
18	1K-24A		-7.7
19	1K-23		-7.7
WZ4002			-8.3

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MODERN CONCEPTS AND TRENDS OF CHEMICAL APPROACHES TO ENVIRONMENTAL ISSUES

In recent years there have appeared certain approaches aimed at reducing environmental pollution – "green" analytical chemistry. Its goal is the application of analytical procedures that produce less hazardous waste, are safer to use, and are more environmentally friendly.

Analytical methods are based on chemical reactions and electrochemical processes, as well as on interaction with all forms of energy (in particular, radiation), which give unambiguous signals directly from the place where something important for the chemist happens in the volume or on the surface: solid substance, liquid or gas. As is known, the analytical procedure for obtaining data consists of several stages: field sampling and sample processing, **quartification**, preparation and separation of laboratory samples, detection and identification [1]. All the above-mentioned must be done with high metrological quality, which means ensuring the above-mentioned parameters with the results of measurements. Whenever analytical methods are improved or replaced, the goal should be to improve the metrological quality of the procedure. Applying the principles of green chemistry to analytical procedures almost always leads to an improvement in the quality of the method – an increase in value and importance. Besides this, we can witness [4]:

- reduction of the number of solvents and other compounds in the process, which reduces the possible negative impact on the analyte;
- reduction of the stages in the process of sample preparation or separation, which reduces the sources of measurement errors and uncertainties;
- miniaturization and energy savings, which lead to a more reliable and simple analytical process.

Liquid-phase microextraction methods, which provide rapid, convenient, and high-throughput approaches to sample preparation, can be improved by modification. An example of their significant and diverse advantages is the addition of surfactants: the surface of a solid substrate or a capillary is modified at first, and then micelles are formed, which define different equilibria for chromatographic separation.

Many non-toxic, biodegradable and environmentally safe surfactants are readily available, and the most commonly used organic surfactants have little ecotoxicity [2]. They also make it possible to reduce the proportion of organic solvent in the mobile phase.

The separation that uses water or a buffered aqueous solution containing a surfactant is a good example of green chromatographic analysis, because it eliminates the use of organic solvents [3].

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IMPROVING THE TECHNOLOGY OF MEAT SLICED SEMI-FINISHED PRODUCTS BY USING HYDROCOLLOID ADDITIVES OF PLANT ORIGIN

The analysis of national and foreign literature shows the relevance of improving the technology of meat sliced semi-finished products by introducing plant-based additives into their composition in order to make fuller use of raw material resources in the industry and expand the use of non-traditional raw materials [1; 2].

The expediency of studying this problem is also determined by the need to provide the population with high-quality food products having a balanced composition of nutrients and biologically active substances.

It is well known that meat products are an important constituent part of the human diet. Their nutritional value is primarily determined by the quantity and quality of proteins, as well as by the fats, macro- and microelements contained in these products which are essential for normal human life, along with a number of vitamins and other nutrients that together ensure high taste and digestibility of products.

Currently, the deficit of animal proteins in the human diet has led to the intensive development of new trends in meat product technology, involving the optimal combination of meat and vegetable food components in order to obtain high-quality food products which are balanced in terms of their biological value.

The aim of the study is academic substantiation and improvement of the technology of meat sliced semi-finished products by using hydrocolloid additives of plant origin. The object of research is the technology of meat sliced semi-finished products with the use of hydrocolloid additives of plant origin. The subject of the study is calcium alginate gels, model minced meat masses and sliced semi-finished products based on them.

The following research methods were used: physicochemical, structural-mechanical, organoleptic, as well as mathematical processing of experimental data using modern measuring instruments and techniques.

The use of hydrocolloids of plant origin allows expanding the use of raw materials for meat products and stabilizing the quality of finished products.

For the first time, on the basis of theoretical and experimental studies, the possibility of improving the technology of sliced meat semi-finished products by using hydrocolloid additives of plant origin has been substantiated.

The parameters for the preparation of calcium alginate gels by hydration have been justified. It has been determined that the optimal ratio of sodium alginate to calcium gluconate of 7.5:0.35 at a hydromodulus of 1:12 ensures the stability of the heat-resistant gel structure. The replacement of 7.5 % of meat raw materials with calcium alginate gels has been academically substantiated on the basis of improving the functional, technological, structural and mechanical properties of minced masses.

New recipes of sliced semi-finished products based on minced masses have been developed. The existing technology of sliced semi-finished products with the use of hydrocolloid additives of plant origin has been improved.

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INNOVATIONS IN PHYSICAL THERAPY FOR CHRONIC PAIN TREATMENT

Innovative technologies have advanced significantly in the rehabilitation environment. Rehabilitation professionals are often involved in testing, developing, and modifying new and existing technologies alongside engineering and development teams [3]. These innovations can improve rehabilitation, prevent decline and regression, track change, and help maintain a healthy lifestyle. The ultimate goal of innovative technologies is to improve the quality of life of people with complex injuries and illnesses.

Large-scale changes are taking place with the emergence of new innovative technologies and methods in the field of rehabilitation, which will significantly improve the rehabilitation process in the future.

The technological process has led the way to more accurate, efficient and personalized rehabilitation programs. Robotics has already been created that has improved the work of therapists for the recovery of patients [5]. Virtual reality has also been introduced in the field of rehabilitation, which allows patients to make the therapy process more effective for their injuries. Virtual reality therapy may help patients with phantom limb pain in the early postoperative period [4].

Physical rehabilitation after injuries can be quite lengthy for patients. In addition, often performing basic exercises can be difficult even from a psychological point of view. That is why physiotherapists decided to use virtual reality experiences with gamification elements. Such VR applications allow patients to be more relaxed during procedures, perform more exercises and feel less discomfort during training [1].

Therefore, innovative technologies open new perspectives in rehabilitation medicine, providing innovative, effective methods to support and accelerate the recovery of patients' functions, also these technological shifts open new horizons for optimizing recovery and enriching the practice of physical therapy [2].

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MODERN RESEARCH IN THE FIELD OF GEOGRAPHY

Topicality. Modern geography is characterized by high rates of technological development and extremely high integration of various fields of activity, geography remains an important and relevant science, as it helps not only to understand and analyze complex geographical changes occurring in the world, but also to predict the possible consequences of such changes. Currently, geography uses modern research methods that allow studying interactions between different regions and countries in the context of globalization, helps to better understand the geographical aspects of economic, social and cultural changes taking place in the world, to improve the efficiency of management of available resources

The purpose of the research is the analysis of modern research methods in the field of geography and their practical application.

Analysis of sources: For the analysis of the source base, we used authoritative sources of information that have no doubts about their reliability. From the standpoint

of the ideological direction of research, such resources as: Modern geographical studies [1], Theory and methodology of geographical sciences [2] (data analysis), Geography: a promising modern science or a relic of the past? [3], Consequences of the Great Geographical Discoveries [4], International research of the globe [5], Modern geographical studies [6], Actual problems of today of geographical science and education [7], Socio-geographical research: methodology, methods, methods [8], Methodology of geography [9], Geoinformation systems and technologies and their use in tourism [10].

Geography is an important science because it allows you to study climate change, the location and vulnerability of different regions to natural disasters (the impact of these phenomena on people, ecosystems and infrastructure), studies the development and transformation of cities and regions (propaganda of sustainable development, as well as the preservation of biodiversity).

All these aspects confirm that geography remains a key discipline for understanding the modern world and solving complex global problems.

Indeed, nowadays geography has turned from a descriptive science into an explanatory one. After all, there is practically no unexplored centimeter left on the planet that has not been mapped [3].

Let's summarize the results of the analysis of the source base in a comparative Table 1, which visually compares information about the main discoveries of scientists.

Looking at the table, we can see that researchers have made a great contribution to the development of geography, because by opening new horizons, we expand our knowledge and perspectives, which give us the opportunity to explore different corners of our planet.

The International Polar Years (IPY), when international studies of the Earth's polar regions were conducted, were important for the study of the earth. There were four such years: 1882-83 (First), 1932-33 (Second), 1957-58 (Third), 2007-2009 (Fourth). During the time of the First, 36 volumes of scientific works were published, research was conducted mostly in the geophysical, meteorological, and biological spheres. The second was held at 58 stations. Even radiosonde, radiophysical and acoustic studies of the atmosphere were conducted. The third took place within the framework of the International Geophysical Year. 67 countries took part in it.

**Table 1. The main discoveries of scientists
(compiled by the author on the basis of [1,2 (p.43-54)]**

Researcher	Years	Discovery
Pythagoras	VI ст.	Made the first assumptions about the sphericity of the Earth
Eratosthenes		Made the world's first map of the world using a geographic grid
Claudius Ptolemy		He created the famous work "Guide to Geography", compiled 26 maps of individual parts of the earth's surface and one composite map of the world with a degree grid
Herodotus		He introduced the concept of "historical geography", described the life and lifestyle of the Scythians for the first time
Eric Rudy	X ст.	Discovered the island of Iceland and Greenland
Vasco da Gama	1497-1499	Opened a sea route to India
Fernand Magellan	1519-1522	Made the first round-the-world trip, confirmed the sphericity of the Earth and proved the existence of a single world ocean
Willem Janszon	1606	Discovered Australia
Thaddeus Bellinshausen, Mykhailo Lazarev	1820	Discovered Antarctica
Mykola Mykolayovych Mykluho-Maklai		Proved that people, regardless of race, are related by origin
Frederick Cook	1908	Reached the North Pole
Roald Amundsen	1911	Reached the South Pole
Otto Schmidt		Made the first through sailing from the White Sea to the Bering Sea
Jacques-Yves Cousteau		He studied the oceanic depths. Invented a space suit with scuba diving
Jacques Picard, Donald Walsh	1957	They discovered the deepest ocean depression – the Mariana Trench (11,022 m)
Yuri Gagarin	1961	Made the first flight into space
Leonid Kadenyuk	1997	Made a flight into space as part of the international crew of the American spaceship "Columbia"

Compiled by the author on the basis of [1,2 (p.43-54)].

Then there was the establishment of bases in Antarctica and a number of expeditions into the depths of the continent, the establishment of floating observatories on ice sheets in the Arctic. During the Fourth, more than 800 projects were carried out, which were aimed at determining the current state of the environment in the polar regions. The main areas of activity in the polar zone were defined as:

- creation of a single climate monitoring network in Antarctica.
- global snow, ice and permafrost monitoring system (Global Cryosphere Watch).
- work on forecasting the state of seas and glaciers [5].

One of the important results of the development of geography can be considered the creation of a new science – ecology, which studies the impact of man on the environment – and vice versa. It is necessary to develop accurate means of predicting natural disasters for the timely evacuation of the population. Research of the World Ocean and space also has an important role for the further search for resources important for the development of mankind. The creation of nature reserves and even the development of tourism are tasks facing geographers [3].

Geographers use the general scientific balance method. In all cases, when we know the amount of one or another resource component and the directions of its use, it is advisable to analyze its balance by comparing "income-expenditure". In social geography, balances of natural resources, population and labor resources, fuel, electricity, food, freight flows, production and consumption, income and expenses are considered. More special is the method of inter-industry balances, according to which the movement of certain resources between industries and between regions is analyzed [8, p. 88].

It is geography that studies the world around us as functionally whole, tries to combine the study of objects with different genesis. And precisely because of this synthetic essence, geography does not fit into the generally accepted variants of the classification of sciences. It is not for nothing that due to this specificity, in most pedagogical universities, the relevant faculties are called natural and geographical faculties [7, p. 3].

Thus, the Great Geographical Discoveries summed up the previous historical period and created opportunities for the further development of European civilization [4]. Because geographical research requires a wide range of methodological approaches that mutually complement each other [9, p. 15].

But not all the secrets of the Earth have been solved yet. And modern technologies and innovative equipment give geographers access to research that their colleagues could only dream of decades ago. This is the study of the glaciers of Antarctica, and the highest mountain peaks, and the deepest ocean depressions, and even space [3]. Among the modern means of research in geography, one can also note the use of space technology (satellite images, global positioning systems, climate analysis, etc.), the creation and wide implementation of geoinformation systems. And from the most modern, you can evaluate the use of artificial intelligence.

Space probes exploring the Earth are equipped with special photography devices, with the help of which space pictures are obtained. Analyzing them, people

can immediately look around the vast expanses of the Earth. The biggest features of the structure of our planet became visible from a height. From the surface, they are simply impossible to distinguish. From space, it was possible to look into hard-to-reach corners of the Earth: highlands, polar regions, vast oceans, forests and deserts. Space vehicles are used to observe natural phenomena: volcanic eruptions, river floods, snow avalanches, storms. Pictures quickly and, most importantly, safely convey information about the disaster area. Meteorological satellites "survey" the Earth and determine the nature of cloud cover and the distribution of snow cover. Space images help predict the weather, find mineral deposits, and determine the extent of pollution on the Earth's surface. There is no doubt that we are standing on the threshold of a new era of great discoveries: outer space and, with it, our planet [6].

Among the main sources of data for geoinformation systems are remote sensing materials. They combine all types of data received from space carriers (manned orbital stations, satellite cameras systems) and aviation based (planes, helicopters) and make up a significant part of remote data contact types of shooting, methods of obtaining measuring data systems in conditions of physical contact with the shooting objects. To contactless in addition to aerospace, shooting methods include various measuring systems marine and land-based, including phototheodolite surveying, seismic, electrical, magnetic surveying, hydroacoustic surveys of the topography of the seabed with the help of side view sonar, based on registration of own or reflected wave nature signal [10].

Contemporary research in geography reflects a dynamic and interdisciplinary approach to understanding the complex relationships between people and the environment. Modern methods and means of research in geography cover a wide range of topics, include advanced technologies, geo-information systems and provide qualitatively new opportunities to ensure sustainable development.

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IMPROVING THE TECHNOLOGY OF MEAT SLICED SEMI-FINISHED PRODUCTS ENRICHED WITH MICRONUTRIENTS AND MINERALS

In recent years, the global market for new technologies and food products has seen a trend towards an increase in the number of qualitatively new products designed to prevent and treat various diseases, strengthen body defenses and reduce the risk of exposure to toxic compounds and unfavourable environmental conditions. Under market conditions, the dynamic development of the food industry is carried out mainly by the introduction of new intensive low- and zero-waste technologies and the production of health and preventive food products based on them. Of particular concern is the lack of essential micro- and macronutrients in the diet, which causes such serious diseases as iron deficiency anemia, rickets, osteoporosis etc. [3, 4].

The problem of calcium deficiency in the daily human diet has become quite relevant. This is primarily due to the excessive phosphorus content in most food products – meat ones in particular, as well as because of the wide use of phosphates in the processing of food raw materials [1, 2].

Calcium supply is determined not so much by its absolute amount in the body as by its ratio to other nutrients: proteins, fats, carbohydrates, minerals, and, above all, phosphorus.

Taking into account the modern requirements of nutrition and the current economic situation in Ukraine, due to the use of the latest technology, we actively search for and develop new recipes for meat products with a specified chemical composition, which would be balanced in terms of protein, fat and carbohydrates, water, minerals and vitamins.

In this regard, there arises a need to improve the technology of semi-finished meat products enriched with essential nutrients, namely calcium lactate. There is no information in the academic literature on the use of calcium lactate in the composition of meat sliced products.

Based on the above, the improvement of the technology of meat semi-finished products with calcium lactate aimed at ensuring high quality and biological value of sliced masses, as well as the rational use of raw materials, is relevant, timely and complies with the state policy of Ukraine on healthy nutrition of the population.

The aim of the study is scientific substantiation and improvement of the technology of meat sliced semi-finished products enriched with micronutrients and minerals.

The object of research is the technology of meat sliced semi-finished products using calcium lactate.

The subject of the work is calcium lactate, model minced meat masses and sliced semi-finished products based on them.

Physicochemical, microbiological, structural and mechanical, organoleptic methods were applied in the study, along with mathematical processing of experimental data using modern measuring instruments and techniques.

For the first time, on the basis of theoretical and experimental studies, the possibility of improving the technology of meat sliced semi-finished products by using calcium lactate has been justified.

The effectiveness of adding calcium lactate in order to increase the content of organic calcium in meat sliced semi-finished products has been theoretically substantiated and experimentally confirmed. The organoleptic and physicochemical quality parameters of the finished product have been investigated.

New recipes for sliced semi-finished products on the basis of minced meat masses have been developed.

The existing technology of sliced semi-finished products using calcium lactate has been improved.

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NEW APPROACHES AND PROCEDURES IN CANCER TREATMENT. CURRENT PERSPECTIVES ON THERMAL ABLATION

The basic cancer treatment modalities include surgery, radiation therapy, chemotherapy, and targeted therapy, which can further include gene expression modulators, immunotherapy, angiogenesis inhibitors, hormone therapy, and so on [9]. However, there are more recent methods that have emerged not long ago, and the aim of this paper is to discuss some of them.

Ablation is a treatment technique that destroys tumors without removing them. It is mostly indicated for small-size tumors (less than 3 cm) and the surgical option is contraindicated. Ablation is also used with embolization for larger tumors. However, this technique might not be indicated for treating tumors near major blood vessels, the diaphragm, or major bile ducts due to destroying some of the normal tissue around the tumor [3].

The technique of thermal ablation involves extreme hyperthermia or hypothermia to destroy tumor tissue concentrating on a focal zone in and around the tumor. Similar to surgery, thermal ablation removes the tumor and a 5–10 mm thick margin of seemingly normal tissue but the tissue is killed in situ and then absorbed by the body later. The procedure is similar to surgery using an open, laparoscopic, or endoscopic approach but is commonly applied using a percutaneous or non-invasive approach. The type of tumor, site, physician's choice, and health status of the patient determine the approach to treatment [8].

Radiofrequency ablation (RFA), microwave ablation, high-intensity focused ultrasound, and cryoablation are currently being used in the clinical setting. Cryoablation

uses a hypothermic modality to induce tissue damage by a freeze-thaw process against others. All these treatments operate on the principle of hyperthermia except cryoablation. Of all the ablation techniques, cryoablation demonstrated the highest potential to elicit a post-ablative immunogenic response [10].

Recent studies showed that in addition to tissue disruption RFA and cryoablation can modulate the immune system that they were applied as therapy on TM and in systematic circulation. Evidence has shown that ablation procedures affect carcinogenesis due to its local inflammatory response leading to an immunogenic gene signature [6]. The advantage of this procedure over surgery is that it provides a minimal (e.g. percutaneously or laparoscopically) or non-invasive approach to cancer therapy and gets attention as an alternative to standard surgical therapies [2].

Cryoablation is one of the ablation techniques which ablates the extensive tissue by freezing to lethal temperatures followed by liquid formation, influencing the extensive tissue. Benign and malignant primary tumors are mostly treated by this therapy [4]. James Arnott reported that freezing temperatures can impair cancer cell viability after he attempted the usage of cold temperatures by salt and ice solutions for the generation of local numbness before surgical operations in the nineteenth century. He suggested cryoablation as an attractive therapeutic option and increased a patient's survival [5].

RFA therapy is a minimally invasive procedure and an image-guided technique using hyperthermic (high-frequency electrical currents) conditions to destroy cancer cells. Imaging techniques, such as ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI), guide needle electrodes into a tumor cell. Generally, RFA is the most effective approach for treating small-size tumors of less than 3 cm in diameter. RFA can be used in combination with other conventional cancer treatment options [7]. After starting the use of deployable devices or multiple-electrode systems, RFA can treat medium tumors (up to 5 cm in diameter) [1].

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TECHNOLOGY OF PROBIOTICS PRODUCTION

Probiotics is a term for living microorganisms that if consumed in adequate quantities, are beneficial to human health. The term "probiotics" includes probiotic medicines, probiotic foods (dietary and food supplements) and genetically modified probiotics. Since 2001, according to the recommendations of the World Health Organization, when using probiotics, the genus and family name of the strain with the definition of its genotypic and phenotypic characteristics, as well as data on the mechanism of action obtained in vitro, justification of clinical efficacy based on the results of studies in the human population, should be indicated. Besides, the aspects of antibacterial resistance, metabolic activity, side effects, toxin-producing and hemolytic activity, and lack of invasiveness in animal testing should be determined.

Today, we know the mechanisms of action of probiotics that protect the human body from infectious diseases. Among them: strengthening the epithelial barrier, inhibition of adhesion of pathogenic microorganisms, competitive inhibition of growth of pathogenic microorganisms, production of antibacterial substances and modulation of the immune response.

According to the classification established in 1996, drugs that normalize intestinal microflora are divided into 4 generations: I – classical monocomponent preparations containing one strain of bacteria; II – self-limiting antagonists; III – combined preparations that consist of several strains of bacteria or include additives that enhance their effect; IV – live bacteria that are immobilized on the preparation, the representatives of normal flora.

A prerequisite for the development of technology and production of probiotics is to maintain their stability over a long period of time. Bacterial drugs containing live microorganisms are the least stable, as their activity can be reduced by cell death. Microorganisms, due to their low level of biological organization, remain viable even when completely dehydrated, in which case metabolic processes in the cells only slow down or stop. To prolong the viability of bacteria, it is advisable to perform freeze-drying, which is done at low temperature and deep vacuum (low oxygen concentration). Dry biological products are sealed under vacuum or in an inert gas stream due to their hygroscopicity.

Factors affecting the survival of microorganisms in dry probiotic preparations during storage include the regulated residual moisture concentration, the presence of protective substances, and storage of dry medications in an oxygen-free atmosphere.

To protect probiotics from the acidic environment of the stomach, acid-resistant coatings are applied to tablet and capsule forms or bacteria are immobilized on a sorbent.

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NUTRITIONAL AND BIOLOGICAL VALUE OF D-ELEMENTS

As is known, d-bioelements make up approximately 3% of the human mass. They play an important role in the proper functioning of the body and in maintaining a person's mental health. Both a lack and an excess of d-bioelements in the human body lead to negative consequences.

In this study, an assessment of the nutritional value of the daily diet has been carried out; an analysis of literary sources has been performed in order to determine the biological role of some d-elements, as well as their content in food products, the symptoms of their excessive amount and shortage, and daily requirements for

their quantity. The awareness of these issues will allow adjusting the food menu and adding the necessary products to the daily diet. In order to evaluate the nutritional value of the daily ration according to mineral composition, food and drink intakes were recorded during the week. According to electronic sources [2], the content of bioelements was calculated in the consumed food and beverages and the intake of some of d-elements per day was determined. The data are given in the Table 1.

Table 1. Assessment of the nutritional value of the daily diet by mineral composition

Bioelement	Fe	Co	Cu	Cr	Zn
Daily need for electronic links [1]	18,000	0,010	1,000	0,050	12,000
Estimated intake, mg/day	5,366	0,016	1,00	0,031	4,470
Percentage of there quired level of consumption, %	29,81	157,71	100,44	61,28	37,25

According to the received data, only the level of copper consumption is in the norm. There is a significant lack of Ferrum, Chromium and Zinc ions, and Cobalt, on the other hand, is consumed in excessive amounts. Having analyzed the literary sources [1], we considered the biological role of each of these bioelements and revealed the consequences of their action on the body, caused by their lack or excess. Thus, we could make conclusions about changes in the daily menu in order to increase or reduce the consumption of necessary bioelements.

Ferrum is a vital element. It is present in all tissues; however, it is the most concentrated in erythrocytes. Ferum participates in the process of oxygen transfer, stimulates intracellular metabolic processes, increases general state of health, is a component of protoplasm and cell nuclei, supports normal functioning of the immune system.

Cobalt is the central atom of the complex compound cobalamin, which is more known as vitamin B12. Cobalt participates in the processes of hematopoiesis, contributes to the synthesis of muscle proteins and thyroid hormones, affects nitrogen assimilation and carbohydrate metabolism, improves absorption of iron, retinol, tocopherol acetate, ascorbic acid and increases the synthesis of cyanocobalamin.

Copper plays the role of a catalyst of oxidation-reduction processes in living organisms. There are known more than 50 proteins and enzymes in which copper ions have been detected. Copper plays an important role in the antioxidant defense system, takes part in reactions of assimilation of iron, group B vitamins, and ascorbic acid; it participates in the formation of elastin of blood vessels, as well as of

collagen, which forms the protein framework of the skeleton bones. Copper deficiency is almost not observed in healthy people.

Ions of trivalent chromium are quickly absorbed and, in general, have positive effect on the human body, unlike hexavalent ions of chromium, which are a recognized carcinogen. They take part in the regulation of sugar balance in the body by increasing the sensitivity of cells to insulin, as well as in the metabolic processes of carbohydrates; they provide the breakdown of fats and lower cholesterol, minimizing the risk of formation of cholesterol plaques and the development of atherosclerosis.

Zinc participates in biochemical processes. It regulates metabolism, supports reproductive function, participates in the synthesis of insulin and testosterone, has antioxidant effect, participates in the formation of bone tissue, helps to preserve normal functioning of the musculo-skeletal system, and prevents the development of rheumatism and arthritis.

Based on the analysis of literary data, we have reached the conclusion that the result of improper nutrition is rapid fatigue and weakness of the immune system. It has been determined that in order to balance the appropriate amounts of the specified d-bioelements, people need to eat more fruits, nuts, seafood, beef and legumes, as well as reduce the consumption of leafy vegetables, bread, cereals and poultry meat.

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EFFECTS OF MELATONIN ON OXIDATIVE STRESS AND DIABETES-INDUCED CHANGES IN KIDNEYS

Diabetes mellitus type 2 (T2DM) is associated with various renal complications, including alterations in protein profiles and oxidative stress. Our study deals with the effects of melatonin on renal function and protein distribution in rats with experimental T2DM. Oxidative stress contributes to the formation of beta-amyloid

plaques, leading to neurodegenerative and cardiovascular diseases [5]. Moreover, inflammatory processes and ion redistribution further intensify protein aggregation [2, 6].

Rats were induced with streptozocin to develop T2DM and subsequently treated with melatonin. Various biochemical and physiological parameters were monitored to assess the impact of melatonin on kidney function, oxidative stress markers, enzyme activities, ion exchange, and protein ratios in the kidneys.

In rats with T2DM, there was a notable increase in the total protein content and kidney mass. The levels of TBA-active compounds rose by 106.3%, whereas superoxide dismutase decreased by 27.4%. Conversely, catalase activity surged by 147.1%. Kidney homogenates showed heightened gamma-glutamyltransferase (GGT) activity. Urea and creatinine concentrations, indicative of impaired kidney function, were significantly elevated. Additionally, ion concentrations, specifically potassium and chlorine, exhibited significant elevations in rat kidney homogenates. Alterations in protein ratios were evident, with a surge in high molecular weight proteins and a decline in low molecular weight proteins.

Melatonin administration showcased promising therapeutic effects. It reduced TBA-active compounds by 34.5%, advanced superoxide dismutase levels by 19.7%, and curtailed catalase activity by 54.8%. Melatonin also normalized creatinine concentrations and exhibited a moderate stabilizing effect on protein ratios. Furthermore, it mitigated GGT activity, and normalized ion concentrations.

Melatonin's multifaceted influence on renal physiology and biochemistry in T2DM conditions is noteworthy. Its antioxidant properties counteract oxidative radicals and inhibit pro-oxidant production while stimulating endogenous antioxidant production. Melatonin also possesses anti-inflammatory and antidiabetic properties. Its role in influencing insulin or glucagon production via melatonin receptors in the pancreas provides a biochemical basis for understanding its impact on pancreatic function and glucose homeostasis. Studies have shown melatonin's potential to improve dysglycemia by inhibiting hepatic gluconeogenesis and activating hypothalamic Akt through MT1 and MT2 membrane receptors [4]. Furthermore, melatonin's ability to prevent pancreatic islet degradation and improve insulin sensitivity highlights its potential clinical application against T2DM [1, 3].

In conclusion, melatonin administration, particularly at 10 mg/kg dosage, displayed a multi-vector impact on rat kidneys under stress conditions. It inhibited

free radical processes, stimulated internal antioxidant defence, normalized metabolism, protein, and ion exchange, reduced inflammation, and exhibited anti-diabetic effects. Melatonin's positive effect on biochemical indicators and restoration of the rat's entire body homeostasis was evident. Thus, our findings advocate for the utilization of melatonin in the prevention and treatment of oxidative stress-related complications in type 2 diabetes.

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THEORETICAL STUDY OF METHODS OF DRYING VEGETABLES

Drying is the optimal way to obtain long-term storage products with maximum preservation of their original quality, without the use of preservatives and food additives. Dried products are a promising raw material for restaurant businesses, especially for fast food outlets, such as bistros and cafés.

The consumers of these types of products are power structures, special contingent (geologists, athletes, astronauts), the population of Ukraine during the war etc.

Therefore, based on theoretical studies, the advantages of drying have been established, as the native properties of plant raw materials are preserved to the maximum extent; the essence of the physical processes that occur during drying has also been highlighted.

It is well-known that the intensity of drying depends on the physical and chemical properties of materials and the driving force of the process. Promising drying methods in terms of preserving nutritional value, as well as ensuring the appropriate restorative properties of dried vegetables and fruits, along with energy consumption, are freeze-drying with cryodestruction, drying with mixed heat supply and cold spray drying.

The problem of ensuring rational human nutrition, as well as its adequacy and balance, is one of the most important tasks of the joint scientific and practical activity of medical practitioners, food technologists, sociologists, system analysts and information system developers.

Vegetables are an integral part of the human diet, as they contain all the essential minerals, vitamins, dietary fiber etc. However, they are a perishable and seasonal product due to their high moisture content (75...95%) [1].

Thus, in order to provide the population with vegetables throughout the year, it is necessary to preserve them. Since the degree of naturality and nutritional value of products is coming to the fore nowadays, drying is the best way to produce long-term storage products while maintaining their original quality, without the use of preservatives and food additives [2].

The scope of usage of dried products can be very wide. The consumers of these types of products include law enforcement agencies, manufacturing industries, special contingents (geologists, athletes, astronauts) etc. The current government policy is aimed at promoting and spreading a healthy lifestyle, including healthy eating, among the country's population.

That is why the researchers often use the additives made from plant materials in order to create new types of products with the increased nutritional value. In most cases, these are powders made from both traditional and non-traditional raw materials.

It should also be noted that the population's awareness of the need for a healthy daily diet contributes to the growth of immediate consumption of dried vegetables and fruits, especially among children and young people of working age.

A characteristic feature of the present time is the rapid development of restaurant business establishments, in particular, restaurants, cafés, especially fast

food ones, as well as health resort, medical, educational, industrial and other institutions.

In order to improve the provision of services, attract new customers and create competitive products, most of these establishments develop menus with a physiological effect on the human body (e.g. "dietary dishes", "vegetarian cuisine", "vitaminised dishes"). This, in turn, requires not only the availability of fresh plant raw materials, but also the presence of high-quality fruit and vegetable additives.

Drying is the process of dehydrating a product by evaporating the liquid retained in it, changing the temperature of the product. Dried vegetables can be sold in a variety of forms: cubes, slices, chips, straws, powders of various dispersion. Vegetable powders can be stored for a long time without deterioration in quality with almost complete preservation of the original nutritional value and can be used in the technologies of convenience foods.

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DETERMINING CHARACTERISTICS OF LIVING ORGANISMS WITH CONSIDERATION FOR VIBRATIONAL PROCESSES

The ambient atmosphere surrounding a person is saturated with physical fields of various natures, including acoustic ones. It affects living organisms both positively and negatively. Simultaneously, when the resonant frequencies of living organisms' individual organs coincide with certain frequencies of acoustic fields, it can have a detrimental effect, at high oscillation amplitudes.

Noteworthy, that it is necessary to know the mass and stiffness of the body of insects in order to have a negative acoustic effect on their body [1, p. 107]. Tissue rupture and biological death of harmful insects under the influence of acoustic vibrations indicate that the resonant frequency of the body or organ has been found. A method of rupturing bodies, organs, or tissues of a biological object can be

developed by applying a strong influence of an oscillatory nature. Destruction not only of the beetle but also its larvae, as a biological object that is a viscoelastic system, is possible through the influence of vibrational or acoustic oscillations on the body [2, p. 31; 3, p. 1]. This leads to the question of the frequency range of influence, clarification of the larva's body mass and stiffness.

The larvae of the Colorado beetle became the object of our experiment. Measurements of parameters and characteristics were conducted for each larva individually. Preliminary examination showed that the larva's body had reached an age when the head and legs appeared and had an oval-convex shape, widening from the head. During the experiments, the larva's weight was determined, its length measured, and the body diameter at the maximum cross-section. Then the larva's body was placed in a special device. Loads were applied vertically downward onto the larva's body with forces P1, P2, P3, P4, P5.

Changes in the body dimensions, i.e., body shortening under the action of force (compression magnitude), were recorded by a micrometer. All readings were recorded and entered into the measurement log. After the impact, an external examination of the larva's body was conducted.

The indicators of the force impact and measured values were entered into the table. The obtained data allowed for the calculation of the modulus of elasticity and stiffness of the larva's body as a homogeneous rod.

The developed technique has allowed the frequencies of the acoustic field generation used to kill the larvae to be determined. This will allow them to be destroyed in a more environmentally friendly and efficient way.

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1,2,3-TRIAZINES: REACTIVITY AND APPLICATIONS

Triazines serve as a versatile scaffold for many biologically active compounds and feature in numerous clinically used drugs. Some members of this compound class already operated in medicine while others undergoing clinical trials.

Among all isomers of the triazine nucleus (1,2,4-triazines, and 1,3,5-triazines), 1,2,3-triazines often attract interest in medicinal chemistry due to their wide range of activities, including antitumor, antimicrobial, antiviral, anxiolytic, anti-inflammatory, antimicrobial, antihistaminic, and antiviral effects, as investigated in articles [1-5]. Derivatives of 1,2,3-triazine are more preferable because of their high efficacy and minimal side effects [6].

Among the three isomers, 1,2,3-triazines, also known as vic-triazines or v-triazines, are the least studied owing to the peculiarities of their ring system structure [7]. Over the past decade, several reviews on the chemistry and biological properties of benzene- and hetero-condensed derivatives of 1,2,3-triazines have been published. Hetero-condensed derivatives of 1,2,3-triazine are the subject of attention because of their potent biological properties. Benzene-1,2,3-triazines participate in the regulation of cytokines, inflammation, and apoptosis. The best enzymatic activity is exhibited by benzotriazinone. Benzo[d][1,2,3]triazin-4-yl-(4-methoxy-phenyl)-methyl-amine (Fig. 2) is a powerful antitumor compound.

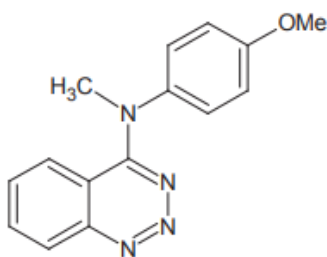


Fig. 2. Benzo[d][1,2,3]triazin-4-yl-(4-methoxy-phenyl)-methyl-amine

Hydrolysis of condensed 1,2,3-triazines (Fig. 1) leads to the cleavage of the heterocyclic ring. The products formed largely depend on the nature of the substituents at the 3- and 4-positions. Hydrolysis in alkaline conditions is caused by N-C bond cleavage, while in acidic conditions, N2-N bond cleavage occurs, with

the intermediate formation of diazo derivatives. The hydrolytic cleavage of condensed derivatives of 1,2,3-triazine is typically a straightforward process, resulting in one or several products with high yields [8].

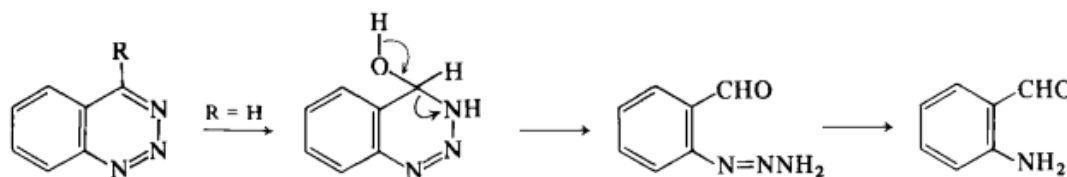


Fig. 3. Hydrolysis reaction of 1,2,3-benzotriazine

Very little is known about the reactivity of the nitrogen atoms in the ring. Oxidation of derivatives of 3-amino-1,2,3-benzotriazin-4(3H)-one has attracted significant research interest. The functional group $-N=N=N-$ is typically unstable to reducing agents, both in 1,3-disubstituted triazenes and in condensed 1,2,3-triazines. A wide range of reducing agents is used in reduction reactions. The hydrolysis of many derivatives of 1,2,3-benzotriazine, as well as hydrolysis and reductive cleavage under certain conditions, can be best rationalized based on the heterocyclic system functioning as a "masked" diazonium compound, used as an azo dye. Reduction of some types of derivatives of 1,2,3-benzotriazine, on the other hand, yields substituted indazoles.

Existing methods for obtaining substituted 1,2,3-triazole compounds are based on constructing the cycle by attaching-alkyne cyclization of an alkyl azide with an alkyne. During alkylation with iodomethane or dimethyl sulfate in the presence of a base, simultaneous alkylation occurs at positions 1 and 2, resulting in the formation of both regioisomers of N-alkyl derivatives (2,3). Obtaining one of the regioisomers is a weak point of many synthetic methods. The mechanism of acylation and alkylation of 1,2,3-triazines involves: acylating or alkylating agent undergoes a nucleophilic attack by the nitrogen atom in the triazine ring, forming a temporary adduct, next step is acid or base catalysis, when possible further reactions [9].

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P. Tishchenko, T. Turyska, O. Osadcha

DIFFERENCE BETWEEN PHYSICAL REHABILITATION AND PHYSICAL THERAPY

Rehabilitation and physical therapy are two branches of healthcare that focus on helping people with injuries or disabilities to regain their physical functions. Even though physical rehabilitation is a bit like physical therapy, and people often mix up these terms, there are some essential differences too. Physical rehabilitation covers more types of jobs, while physical therapy is just one part of physical rehabilitation.

Physical rehabilitation often begins in the hospital after an injury or surgery and can last a long time. It does not stop there though; it may continue in places like nursing facilities, homes with therapy, outpatient clinics, and other places too.

Physical rehabilitation is a term that covers the whole process a person goes through to get back to their best physical shape. Physical therapy is a term that refers specifically to the physical therapy profession. Physical therapists (PTs) play a crucial role in the physical rehabilitation journey. They specialize in movement and work on improving a person's physical abilities through evaluation, setting goals, and using different methods such as strengthening exercises, alignment techniques, balance training, vestibular exercises, and other therapies.

Physical rehabilitation is a broader term compared to physical therapy. It encompasses various professions aimed at helping individuals restore their physical abilities. Depending on your specific needs, you may interact with multiple professionals or just one. Each profession within rehabilitation has its unique approach. They will tailor a treatment plan specifically for you, considering your goals and requirements.

In summary, rehabilitation and physical therapy are vital aspects of healthcare that aid individuals in recovering physical function and independence after injuries or disabilities. Rehabilitation encompasses a holistic approach, addressing physical, cognitive, and emotional needs, while physical therapy concentrates on musculoskeletal conditions within this broader framework. Combining these fields ensures a comprehensive approach to care, crucial for patients' recovery and return to their regular activities.

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O. Trukhym, T. Turyska, O. Osadcha

THE USE OF VIRTUAL REALITY TECHNOLOGIES IN REHABILITATION AS AN IMPORTANT TOOL FOR THE RECOVERY OF PATIENTS

Currently, the problem of the mass need for physical rehabilitation after diseases and injuries has reached huge proportions. Accordingly, medicine is constantly evolving, incorporating information technologies into practice. Since the early 1970s, medicine has started a partnership with computer programs to address various clinical challenges [2]. One of the most interesting areas of modern rehabilitation is treatment using virtual reality systems.

VR therapy uses immersive virtual environments, that simulate real-life scenarios through visual and auditory channels for rehabilitation purposes. This approach is actively used during the treatment of individuals who have suffered

from stroke, burns, craniocerebral trauma, or injuries to the musculoskeletal system, as well as those who suffer from numerous chronic diseases. In addition, the use of virtual reality has shown great effectiveness in the treatment of patients with Parkinson's disease, as well as in the rehabilitation of children with cerebral palsy.

By analyzing present-day research on the use of virtual technologies, it turns out that the results of such treatment are similar or superior to conventional physical therapy or home-based exercises, with the additional benefit of improving motivation for the exercise program [1].

The use of virtual technologies in physical therapy opens up new horizons for quality improvement and efficiency of treatment. These innovative methods not only make the recovery process more available and exciting, but also allow us to individualize therapy programs with regard to the specific needs and capabilities of each patient. Virtual reality, therefore, not only helps in recovering lost functionality, but can also provide a means to reduce pain and stress. VR technologies differ in the possibility of high-quality monitoring. They are able to exactly track movements and keep an eye on the patient's progress. It greatly facilitates the work of the therapist. However, some problems with VR therapy have been revealed, including the discomfort caused by the weight of the headset and cybersickness [3]. It is also necessary to take into consideration the issue of the high cost of equipment and its technological limitations. The use of virtual reality systems is limited now due to the significant costs required to implement them, making them unaffordable for many users. With further research in this area, we can expect and hope to improve this treatment method, helping more people to return to full and active lives.

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REVIEW OF CONTROL METHODS FOR *AMBROSIA ARTEMISIIFOLIA* L.

Ambrosia artemisiifolia L. is an invasive weed species that was introduced from South America to the European continent in the nineteenth century. Since the 1940s, it has been actively spreading across central Europe via logistics routes of cars and trains [3]. The main threat posed by ragweed is the high level of pollen allergenicity and relatively rapid and effective adaptation to new habitat conditions, which is why it competes for territory and nutrients with local wild and cultivated species [2].

Ragweed seeds can remain viable for up to 40 years, so controlling this weed is a complex process, as it can return to cleared areas at any time [1]. For this reason, controlling ragweed populations requires annual monitoring.

To avoid the negative consequences of the spread of *A. artemisiifolia*, including reducing its negative impact on the biodiversity of native species, various controlling ragweed population methods are being developed. The experience of using the methods used in Ukraine and abroad to regulate the number of ragweed populations is of theoretical interest and great practical importance.

Various methods are used to control ragweed. They can be divided into those suitable for use in agroecosystems and urban ecosystems. Some methods can be combined. It should be noted that before starting ragweed control measures, it is recommended to cover exposed skin, respiratory tract, and eyes, as the plant's pollen is a strong allergen [4].

Methods that can be used in agroecosystems:

1. The chemical control method has long been used as one of the most effective. However, despite this, in most countries that are part of the European Union, there are already restrictions on herbicide usage due to their negative impact on all other plants and animals that eat treated plants [8]. These factors directly threaten public health. Therefore, due to the risk to human health, this method should be utilized only in agroecosystems.

2. The US uses the method of crop genetic modification in tandem with the chemical method. Monsanto's Roundup Ready crops are highly resistant to

glyphosate-based herbicides (a chemical phosphate compound). The series includes varieties of corn, soybeans, legumes, rapeseed, cotton, alfalfa, and wheat [8]. The disadvantage of this method is the use of herbicides, which are deadly to bees.

Methods that can be used in the urban ecosystem and combined with agroecosystem methods:

1. The mechanical method of ragweed control is mowing, cutting, plowing, and other mechanical manipulations with plants. The ragweed should be cut as low as possible, or the plant should be completely uprooted from the soil, always with the root system. This method is necessary to use before flowering, from July to August. Plants that do not bloom or bear fruit can be dried and composted. To prevent the shoots from sprouting again, they should be stored in conditions where contact with the soil is not possible. The uprooted shoots have to be placed in plastic bags together with the soil in which they grew. The bags must be disposed of by incineration or dumping in a garbage can [4]. The mechanical method is effective in both agroecosystems and urban ecosystems.

2. Mulching is the covering of the soil with straw or humus, pebbles, gravel, and recycled tree pruning waste, which will protect the soil from adverse environmental factors, including weed germination. It is important that the mowing procedure and subsequent mulching be done before the development of ragweed inflorescences [6].

3. The biological method involves the use of phytopathogenic fungi from the genus *Phyllachora* [5], or phytophagous insects that feed on ragweed: *Epiblema strenuana*, *Ophraella communis*, *Tarachidia candefacta*, *Zygogramma suturalis*. However, researchers note that it is not yet possible to control the number of these insect populations, which significantly reduces the effectiveness of the method. In addition, most species of gerbils and voles eat ragweed seeds, which are rich in oils [7], and this can reduce the soil bank of ragweed seeds.

4. A modern, effective, and, most importantly, safe method is the phytocenotic method. Its essence is plowing the soil with shredded plant residues, followed by sowing perennial cereal-legume grass mixtures or lawn grasses. Such artificially created stands of perennial plants, especially those that form a turf cover, effectively suppress the further growth of ragweed [5]. The advantages of the phytocenotic method are its relative cheapness, durability, and the possibility of combined use in agro- and urban ecosystems.

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PANEL 2
Topical Issues of Social Sciences and Humanities
(DNU, Zoom)

M. Bilous, K. Kutovyy, O. Osadcha

STUTTERING: CAUSES AND THE WAYS TO OVERCOME IT

Stuttering is a disorder that appears as an interruption in the smooth flow or “fluency” of speech. Breaks or disruptions that occur in the flow of speech are labelled “disfluencies” [3]. All speakers may experience disfluent events, especially under certain conditions, such as nervousness, stress, fatigue, or complexity of a language. Stuttering, on the other hand, is a different type of disfluency. Stuttering usually begins in early childhood when speech and language skills are expanding, and other developmental learning take place. Current data suggests that approximately 75-80% of children who stutter at some time in their development will recover. Currently, over 2,5% of Ukrainians of the population stutter. Males are three to four times more likely to continue to stutter into adulthood than females.

What causes stuttering? Doctors and scientists are not completely sure why some children stutter. But most believe that a few things contribute to it, such as a problem with the way the brain’s messages interact with the muscles and body parts needed for speaking. Speaking about the causes of stuttering, the scientist defectologist, candidate of pedagogical sciences, associate professor Rudolph Kraevsky wrote that often stuttering develops due to incorrect pedagogy techniques that traumatize the child’s psyche. The scientist noted that in the case of children’s stuttering, inaccuracy was observed in the vast majority of cases (by this term, Rudolph Kraevsky implies dyslalia, rhinolalia, dysarthria and speech disorders in children with reduced hearing) [1].

Approximately 60% of the individuals who stutter have a first- or second-degree relative who stutters. Stuttering can also result from imitating the speech of a close individual. Children may experience stuttering when trying to express more than their current language capabilities allow, leading to hesitations, pronunciation issues, and stuttering. Imposing high expectations, such as reciting poems, repeating

recently read texts, etc., and emphasizing attention on pronunciation flaws. As the child strives to please their parents more and more, internal tension reinforces stuttering.

Stuttering takes many forms and can be differentiated from the typical kinds of speech breaks that all speakers exhibit. In general, most children tend to have more disfluencies as they are developing longer and more complex language structure. There are less typical (stuttering-like) dyslexias and typical dysflexias.

Stuttering can become more difficult to deal with as children grow older. They may become more self-conscious and lack confidence in speaking situations. If left untreated, stuttering has the potential to affect future decisions, including job choices and social relationships. If a child is 5 years old and still stutters, talk to a doctor or a speech-language therapist. Check with a speech therapist if the child tries to avoid situations that require talking, changes a word for fear of stuttering, has facial or body movements along with the stuttering, repeats whole words and phrases often and consistently, repeats sounds and syllables more often, has speech that sounds very strained.

Not less interesting and original, according to R. Kraevsky, seems the didactic method described by A. Yevgenova and M. Smirnova. It is based on expressive speech, the most characteristic feature of which is the segmentation of phrases on segments – syntagms. From the articulation of speech, R. Kraevsky believed, often the essential meaning of the entire phrase directly depends on the segment that is pronounced in one flow – almost as one word. According to scientists, this method allows avoiding stuttering in speech in any circumstances almost completely. According to the scientist, a child's visit to a speech therapist's office along with medical measures and the participation of parents in this process can give positive results if the right relationships are established to the system the teacher – a child with stuttering – parents. As for the relief of stuttering, you can reduce things that tend to exacerbate stuttering. Temporarily avoid creating situations that are likely to increase the child's disfluencies. These situations may include talking on demand to an adult or talking in front of the class. In conclusion, fostering respect for individuals with stuttering is paramount for creating an inclusive and compassionate society. Stuttering, a complex speech disorder, should not be a basis for judgment or prejudice. Instead, it requires understanding, patience, and a commitment to dismantling societal misconceptions surrounding this condition. By fostering respect and empathy, we contribute to building a world where everyone, regardless of their fluency, is afforded the dignity and understanding they deserve.

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HISTORICAL MEMORY AND PROBLEMS OF NATIONAL SELF-DETERMINATION IN MODERN UKRAINIAN REALIA

The intensive development of the globalization process, the «compaction» of dialogue interaction of different peoples and cultures actualize attention to socio-historical memory as one of the most important tools for preserving national identity. The characteristics of dominant trends in the modern world make it possible to state that the problems of historical memory have begun to be widely articulated in public discourse. In the process of national and state formation, history becomes an important socio-political factor, and the divergence of political moods is the equivalent of different interpretations of the historical past. Experts say that the future of statehood depends on the peculiarities of the interpretation of the past. However, later the term «memory» and related initiatives began to spread rapidly to various aspects of social ideas about the past. Over the last decades, it has emerged, according to the American historian Kervin Klein, a whole «memory industry» [1, p.128].

National and historical memory includes knowledge of events, traditions, ideas, theories, all that people are aware of their past and their attitude to this historical wealth. This knowledge and evaluation attitude become a motivation for the behavior of social groups in public life. Historical memory is especially actualized in turning points, crisis epochs when the existence of ethnicity is undergoing serious and harsh trials. It consists of several most important factors, first of all, it is the consciousness of its origin and ancestors. These origins are not exposed or require dating, but common origin and blood affinity are often relative, and can be said to be mythical.

In general, «historical memory» is interpreted as a set of ideas about the social past that exist in society at mass and individual levels, taking into account their cognitive, figurative and emotional aspects. In this case, «mass knowledge of past social reality is the content of «historical memory». Or «Historical Memory» is the basic point of mass knowledge of the past, the minimal set of key images of events and personalities of the past in oral, visual or textual form, which are represented in active memory, and no effort is required to mention them» [2, p.37-39].

Already at the end of the twentieth century, a statement was widespread in Western scientific thought, according to which all national history is a «constructed memory» as a special socio-cultural phenomenon of understanding the individual and society of its place in time. German philosopher Y. Habermas puts forward as the main dynamic characteristics of history the ability of a person to critical rationality and open democracy.

Michael Oakshot explores historical memory as a form of representation of a «generalizing image of the past», which can be considered in three sections: 1) the past shown in the present, which can be called «practical», «pragmatic», and «didactic». This past is not just suggested in the present, it is an integral part of it, such as the houses we live in, books, phrases that are constantly repeated; 2) a fixed past, we are talking about products, the results of past human activity, which are clearly perceived as those created in the past. These can also be examples of the first practical past, but only if they are clearly associated with the past, as well as elements that are not used in the past, such as archival documents, can be included in the past. 3) the past that is constructed in the human consciousness. This image of the past is created on the basis of a fixed past, namely, its remains that have been preserved. But this past, unlike the previous one, is not physically shown in the present, it exists only within the human imagination and is controlled by the media, textbooks, power top and intellectual elite. [3, p.165] We are talking about the past reality that our knowledge of it is constructed. It is the basis of the commission mechanisms of modern society, which act as methods of creating images and constructs. We argue that historical memory as a product of a specific cultural formation can be a relaying of ideas about the past only at a particular time of reproduction or constructing with dominant visions of a given past. These ideas contain information about what has happened in the past and about unreal events. Events that preserve historical memory acquire ratings, and positive or negative

connotations that may be different from versions of official history. It is worth considering the selectivity of historical memory: some events are stored in it; the memories of others are completely erased. At the same time, historical memory has the problem of «displacing unwanted in perception».

In the process of analyzing the action of commercial mechanisms, it is necessary to understand the structure of historical memory, and which of its components is dominant in creating an «image of the past» in a given society at a certain point in time. Structuring historical memory, we can distinguish the following elements: a) memories of origins and ancestors; b) the idea of the historical formation of the ethnic group; c) memories of the so-called golden age – the time of political, economic stardom grandeur; d) «personified» historical memory – images and actions of heroes, saints, prominent public figures, military, etc.; e) memories of relations with the surrounding states (most often these are memories of wars); e) confessional memory, which contains the idea of cultural orders, acceptance of religion, its fate [4, p.6].

A common feature between these components is that historical memory retains information accumulated by the social system. The availability of memory supports the continuity of public consciousness, which ensures the identity of different social actors. In public opinion, "modern" is separated from the historical «past» interval in forty-fifty years. After this time, the former contradictions usually disappear. However, the past plays an important role in national consciousness. It is one of the elements that strengthen or destroy the socio-psychological unity of the nation. It is easier for the masses to control the power of imagination rather than brutal physical force. The information is transformed into the main tool of cultural hegemony.

The commemoration privatizes the past, combining the primary movement of decontextualization with the secondary – recontextualization, and the latter allows the commemoration to privatize the past, which was previously felt at a general level. Because of this, the best metaphor for decontextualization will be a clean overlaid corner of the board. As a consequence, not only important social events but also the random circumstances in which they occur will be recorded in a wiped place on the board. And the decisive result is that there is a completely accidental, but strong connection between the past, which is honoured, and relevant features of memory. Community also allows us to combine different types of historically and

politically significant «macroevents» with the «microevents» of our daily life, which occur during the commemoration.

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N. Boiko, L. Repp

LINGUISTIC REPRESENTATION OF THE CONCEPT HEALTH IN THE ENGLISH WORLDVIEW BASED ON THE ENGLISH LEXICOGRAPHIC SOURCES

The expression "Child's health is the nation's health" is often heard. Currently, health statistics are alarming due to the COVID-19 pandemic, therefore its value is increasing every year.

The relevance of the topic is related to the fact that one of the main objects of modern cognitive linguistics is the peculiarities of the verbalization of a concept. The studied phenomenon HEALTH can be called universal because health has always been and will be the main condition of human existence, as it determines the quality and length of life.

The work aims to analyze the concept HEALTH and investigate ways of its verbalization based on lexicographic sources of the English language to reveal the peculiarities of this phenomenon.

Four dictionaries have been chosen to study the topic: Cambridge Dictionary [7], Collins English Dictionary [8], Longman English Dictionary [10], and Macmillan English Dictionary [12].

The coverage of the concept of lexicographic sources is ambiguous and is considered from two points of view. Linguists interpret the dictionary, firstly, as a collection of the lexical units organised in a certain way with comments on

the characteristics of their structure, functioning, and origin [1, p. 24]; and secondly, as evidence of the linguistic and cultural development of a certain ethnic group which forms a worldview that is constantly changing and normalising [3, p. 79].

The concept is the basic unit of the linguistic worldview, which remains the focus of attention of such famous linguists as W. Humboldt [9], K. Ludwig [11], O. O. Selivanova [6], S. Ya. Yermolenko [2].

The theory of the German philologist W. Humboldt about the inner form of language and its function became the impetus for understanding the existence of the phenomenon of the linguistic worldview: thanks to it, a person has the opportunity to interpret the world which leads to the formation of his view [9, p. 59].

The opinions of philologists agree that the concept is a multifaceted phenomenon, the result of mental processes of learning information about the world and its reality, formed in human consciousness. In medieval conceptualism, the term is defined as a universal notion that summarises the characteristics of objects.

As for the methods of linguistic representation, concepts can be expressed: 1) lexically (through one lexeme or phraseme, contextual synonyms, metaphorical nominations) (such a concept is called lexicalised [5, p. 503]); 2) phraseologically (using phraseological units, idioms, aphorisms, proverbs, sayings); 3) grammatically (through grammatical forms, categories, constructions) [4, p. 82].

Having considered the entire set of lexical units, with the help of which the concept is verbalized, it is possible to understand the meaning of the concept in the mind of a certain people.

HEALTH is one of the basic anthropocentric concepts, as it is directly related to human well-being and vitality.

The conducted review of ancient theories allows us to state that health is a harmonious combination of physical and spiritual aspects of a person, which forms internal integrity; and its preservation depends on observing the "golden mean". In addition, health is considered a resource necessary for functioning in society.

In the lexicographic sources selected for the study, 89 lexical units verbalizing the concept *HEALTH* were found: 77 were in all four dictionaries, 10 were in all besides the Macmillan Dictionary [12], 1 was only in the Macmillan Dictionary [12], 1 was only in the Collins English Dictionary [8]. Among them are:

- 42 idioms: *a clean bill of health; under the weather; out of sorts; (as) fit as a fiddle; in good/bad/poor etc shape; in shape/out of shape; be in no fit state to*

do something; be/look a picture of health; in rude health; alive and kicking; be back on your feet; a new lease of life; (as) white as a sheet; have a frog in your throat; turn someone's stomach; sick as a dog; on the mend; be (as) right as rain; be at death's door; down in the dumps; knock someone sideways/for six; the worse for wear; on its last legs; weak as a kitten; up and about; in the pink; be green around the gills; hale and hearty; like death warmed up; be full of beans; fighting fit; be as sound as a bell; in fine/good fettle; be of sound/unsound mind; not right in the head; bring somebody/something around/round; as right as a trivet; feel/look like a million bucks/dollars;

- 23 adjectives: *healthy, unhealthy, well, unwell, fine, all right, okay, fit, unfit, robust, ill, sick, sound, unsound, lusty, sane, insane, trim, conscious, unconscious, comatose, run-down, off colour;*

- 14 verbs: *burn (yourself) out; to recover; get over; to recuperate; come down with something; pull through; to cure; to mend; to pick up; black out; pass out; to faint; to heal; to glow (among them – 7 phrasal verbs);*

- 9 nouns: *well-being, strength, weakness, illness, sickness, fitness, vigour, wellness, bloom;*

- 1 phrase: *ill health.*

The data obtained from the sample show that the most common variant of linguistic expression of the studied phenomenon is the idiomatic model (47%). Adjective, predicative, nominative models are less common – 26%, 16% and 10%, respectively. Verbalization using a word combination is 1%.

According to the structural principle of the classification of phraseological units based on their ability to perform the same syntactic functions as a word, the found idioms can be divided into the following groups:

- verbal: *turn someone's stomach; knock someone sideways/for six; look/feel like death warmed up; bring somebody/something around/round (4 pcs);*

- substantive: *a clean bill of health; a new lease of life; have a frog in your throat (3 pcs);*

- adjectival: *under the weather; out of sorts; (as) fit as a fiddle; in good/bad/poor etc shape; in shape/out of shape; be in no fit state to do something; be/look a picture of health; in rude health; alive and kicking; be back on your feet; (as) white as a sheet; sick as a dog; on the mend; be (as) right as rain; at death's door; down in the dumps; the worse for wear; on its last legs; weak as a kitten; up and about;*

in the pink; be green around the gills; hale and hearty; be full of beans; fighting fit; be as sound as a bell; in fine/good fettle; be of sound/unsound mind; not right in the head; as right as a trivet; feel/look like a million bucks/dollars (35pcs).

After dividing the selected idioms according to the structural principle of the classification of phraseological units, it was found that the most numerous group is adjectival – 83%, which indicates the tendency of the English-speaking society to describe the general state of health, one's feelings, mood. Verbal category is 10%; the obtained result proves: verb lexemes as verbalizers of the concept *HEALTH* are used to indicate the process of strengthening or worsening of health. The least common substantive group is 7%; substantive idioms are mostly used to name a symptom or period of recovery.

All lexical units can also be divided into those that provide positive and negative state assessments. The norm is the satisfactory functioning and efficiency of the organism, that is, in this case, a person is healthy and able to perform the main vital functions. Any deviation is considered poor or weak health due to lack of energy or illness, for instance.

Positive plan: *a clean bill of health; (as) fit as a fiddle; in good shape; in shape; be/look a picture of health; in rude health; alive and kicking; be back on your feet; a new lease of life; on the mend; be (as) right as rain; up and about; in the pink; hale and hearty; be full of beans; fighting fit; be as sound as a bell; in fine/good fettle; be of unsound mind; bring somebody/something around/round; as right as a trivet; feel/look like a million bucks/dollars; well-being; strength; fitness; vigour; wellness; bloom; healthy; well; fine; all right; okay; fit; robust; sound; lusty; sane; trim; conscious; to recover; get over; to recuperate; pull through; to cure; to mend; to heal; to glow (48 in total, including 22 idioms, 12 adjectives, 8 verbs, 6 nouns);*

Negative plan: *under the weather; out of sorts; in bad/poor shape; out of shape; be in no fit state to do something; (as) white as a sheet; have a frog in your throat; turn someone's stomach; sick as a dog; be at death's door; down in the dumps; knock someone sideways/for six; the worse for wear; on its last legs; weak as a kitten; be green around the gills; like death warmed up; off colour; be of unsound mind; not right in the head; ill health; weakness; illness; sickness; ill; sick; unhealthy; unwell; unfit; unsound; insane; unconscious; comatose; run-down; burn (yourself) out; come down with something; to pick up; black out; pass out; to faint (41 in total, including 20 idioms, 11 adjectives, 6 verbs, 3 nouns, 1 phrase).*

Analysis of the semantics of lexical units allows us to state that English speakers consider health mainly from a positive point of view (54%). This means: their well-being is at a high level because they are focused on that. Accordingly, 46% indicate certain health problems.

The selected variants of the linguistic representation of the concept *HEALTH* can be divided according to the three aspects of health, taking into account their semantics.

Physical health is a state of well-being of the human body, which depends on the work of the cardiovascular and respiratory systems, lifestyle, physical activity, adequate sleep, regular rest, balanced nutrition and the presence of bad habits: *a clean bill of health; under the weather; (as) fit as a fiddle; in good/bad/poor etc shape; in shape/out of shape; alive and kicking; a new lease of life; have a frog in your throat; turn someone's stomach; sick as a dog; on the mend; be (as) right as rain; be at death's door; the worse for wear; up and about; in the pink; be green around the gills; hale and hearty; be full of beans; be as sound as a bell; in fine/good fettle; bring somebody/something around/round; feel/look like a million bucks/dollars; ill health; well-being; strength; weakness; illness; sickness; fitness; vigour; wellness; bloom; (un) healthy; (un) well; fine; all right; okay; (un) fit; robust; ill; sick; (un) sound; lusty; trim; (un) conscious; comatose; run-down; off colour; burn (yourself) out; to recover; to cure; get over; to recuperate; come down with something; pull through; black out; pass out; to faint; to mend; to heal; to glow; in rude health; be/look a picture of health; be in no fit state to do something; be back on your feet; (as) white as a sheet; on its last legs; like death warmed up; fighting fit; to pick up; weak as a kitten; as right as a trivet (81 pcs, 91%).*

Mental health is a state of mental well-being of a person, which is characterised by stress resistance, stable mood, adequate self-esteem and reaction to criticism, absence of mental disorders, ability to control emotions and behaviour: *a clean bill of health; out of sorts; a new lease of life; turn someone's stomach; sick as a dog; on the mend; be (as) right as rain; down in the dumps; the worse for wear; be full of beans; be of sound/unsound mind; not right in the head; feel/look like a million bucks/dollars; well-being; illness; sickness; vigour; wellness; (un) healthy; (un) well; fine; all right; okay; ill; sick; (un) sound; (in) sane; run-down; off colour; burn (yourself) out; to recover; to cure; get over; to recuperate; pull through; to mend;*

to heal; be in no fit state to do something; (as) white as a sheet; knock someone sideways/for six; like death warmed up; as right as a trivet (47 pcs, 53%).

Social health is a state manifested in friendly and effective interaction of people in society, adequate perception of reality, interest in the surrounding world, democratic behaviour: *a clean bill of health; on the mend; be full of beans; well-being; illness; sickness; wellness; (un) healthy; (un) well; fine; ill; sick; lusty; burn (yourself) out; to recover; to cure; get over; to recuperate; to mend; to heal; be in no fit state to do something; be back on your feet; like death warmed up; as right as a trivet (26 pcs, 29%).*

The resulting percentages show that the most important aspect of the general well-being of the English-speaking society is physical health, as it has a large impact on other spheres and the quality of life in general.

Conclusions. To summarise, it is worth noting that health acts as an open multifaceted unit of human consciousness, functioning in the field of modern English-language reasoning, and represents an individual and universal human experience related to the understanding of physical, mental and social well-being in English culture.

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CHANGES IN FAMILY STRUCTURES

Over the past few decades, significant changes have occurred in the family structure that previous generations could not have imagined. Today, diversity in family forms has become a common feature of our time. Marriages are entered into with less enthusiasm, and a preference is given to a later age for this commitment. The divorce rate has significantly increased, leading to a rise in the number of single-parent families. "Reconstituted families" are formed through second marriages or new relationships, including children from previous unions. More and more people are opting for cohabitation before, and often instead of, marriage. In short, the family world looks entirely different now than it did fifty years ago. While the institutions of marriage and family still exist and remain an important part of our lives, their nature has changed dramatically [1].

Psychological models of the basic family can be classified according to the person responsible for the family: father, mother, or a child who has reached the age of competence [3].

In our time, the role of the man in many families has diminished, if not reduced to a minimum. On the one hand, he has lost his former authority, and on the other hand, having dispensed with patriarchal height and inaccessibility, he usually does not become closer to the children. Not so many families now where the father is just "a stranger among his own." Modern statements by teenagers, for example, of this nature, no longer cause surprise: "A man is not like a woman, he works much less but eats much more" [3].

One of the main trends in the modern development of families is the reduction in the number of children. According to the results of sociological research, both men and women express a desire to have fewer offspring on average than was the case in their families. This is explained not only by changes in the status of women, her increased activity, not only by the level of material well-being of the family but also by the tension and conflict in family relationships. One of the most important social problems is the establishment of understanding in the family, its unity, and the ability to overcome difficulties [4].

There is a trend towards the development of nuclear families, meaning the separation of families with children from their relatives. Modern young families increasingly express a desire to live independently of the older generation and manage their household independently. This dynamic has both positive and negative aspects. On the one hand, couples learn mutual respect and responsibility for their actions, but, on the other hand, it may be difficult to achieve mutual understanding without sufficient family experience and advice from parents. An additional negative aspect may be a limited focus on one's own parents [2].

In conclusion, the last decades are marked by radical changes in the family structure. Diversity in forms has become the norm, with new trends emerging in marriages and child-rearing. The role of the man in the family is being redefined, and the desire to have fewer children becomes common. The development of nuclear families has both positives and negatives, fostering understanding but potentially limiting attention to parents. All these changes reflect a new character of the family institution in our time.

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CHARACTERISTICS OF THE PSYCHO-EMOTIONAL STATE OF AN INDIVIDUAL IN WARTIME

Fear, anger, anxiety, pain, disgust and despair, as well as confusion, powerlessness, shame, guilt, apathy, sadness, joy, excitement – all these are the leading feelings and states in the current emergency and military situation. One of the key tasks of maintaining one's mental health is to understand and accept one's emotions. This will reduce the risk of post-traumatic stress disorder (PTSD),

which is typical for people in these periods, and protect our psyche, and possibly our lives.

Fear in times of war is normal and natural, as it helps us to understand the danger and its intensity and to do our best to survive. Fear is not dangerous, but war is. As you know, everyone has different reactions to danger. The most common ones are to “act”, “freeze” or even “fall” from severe pain, from which it seems that you will never return. The lack of predictability, security and control only increases fear and terror, activates all defense mechanisms and ultimately blocks all the emotions we feel to protect ourselves.

In psychology and psychiatry, post-traumatic stress disorder (PTSD) is a disorder characterized by the repeated experience of an external traumatic event, accompanied by symptoms of increased arousal and avoidance of stimuli related to the trauma.

PTSD involves the following symptoms: persistent and intrusive memories of the event, including thoughts, images, or perceptions; recurrent dreams about the event; behavior and feelings as if the traumatic event is happening again; intense psychological distress when there are external/internal stimuli that resemble stimuli from the traumatic event; physiological reactivity to internal/external stimuli that resemble an aspect of the traumatic event [2].

There is a milder and shorter-lived form of stress response – acute stress disorder, also known as psychological shock – a psychological response to a horrific, traumatic, or unexpected experience.

It is known that one of the mechanisms of adaptation to anxiety is the experience of empirical experience, i.e. independent perception of events and phenomena of reality, as a result of which a person gets used to what is happening. However, for people who are not direct witnesses to these events (e.g., emigrants or displaced persons), the process of adaptation is somewhat more difficult, as they do not have this empirical experience. Therefore, anxiety in such persons may be constant, and their inherent sense of guilt only worsens their psycho-emotional state [3].

Another key phenomenon is the so-called emotional seesaw of war. The famous Ukrainian psychologist V. Stancyshyn believes that we are all stuck in the flow of our own emotions. Not because there is something wrong with us, but because there is something wrong with the circumstances around us. We hate and want revenge, we get irritated by small things, we work ourselves to

exhaustion, we lose our sense of purpose and sink into apathy, we joke to keep our morale up, we rejoice in victories, we root for Ukraine. And all this within one day, and all this every day. We are fine. We are on a swing – we have ups and downs. It's just that the swing is very high now and the flight is extremely fast. But the war will pass. We will get down from this swing and stand on our land again. We will stand firmly, feeling calm and strong. The emotional swing will be behind us [3, c. 234].

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ANTI-CRISIS MANAGEMENT AS A SYSTEM OF ACTIVITIES IN PUBLIC ADMINISTRATION

In the modern world, in the context of globalization, the need to solve effectively various socio-economic crises that dictates the need for deep changes in the system of public administration of Ukraine. The relevance of the topic is determined by the fact that the state system in our country goes through large-scale reform. In Ukrainian reality, the term «crisis management» has recently emerged. The reason for the emergence of the term is to form a new type of economy and find Ukraine in the area of crisis development. There are several definitions of «crisis management» in modern economic literature.

Hussarina N. V. gives the following definition: anti-crisis management is a collection of management systems that involves systemic and complex nature, which is aimed at preventing or eliminating negative phenomena for the enterprise, taking into account the use of the overall management potential, development and implementation that allows to eliminate difficulties, to keep and to improve positions [1, p.43].

Anti-crisis management will be defined as management activities, which in

some way assess the prediction of the probability of a crisis, while analyzing the symptoms, there are ways to reduce the negative effects of the crisis and use reserves for promising development.

The problems of crisis management are wide. It can be divided into several homogeneous groups that contain similar problems to some extent:

1. Presentation of pre-crisis situations. If we identify pre-crisis phenomena in a timely manner, we can be prepared for the offensive of the crisis, build mechanisms for preventing it (if it is possible in this situation).

2. The life of the object. The problems of crisis management of this group are diverse and include economic, financial, legal, organizational, socio-psychological problems.

3. Diversification of management technologies. This group of problems includes issues related to the development of effective management decisions and finding the information necessary for making such decisions. Often, a way out of the crisis can be the development of innovative decisions and behavior strategies, but they should be timely and acceptable for the organization.

4. Conflictology and relations with personnel. The solution of these problems is necessary to overcome the crisis, as well as problems related directly to the life of the organization.

The crisis of management is manifested, first of all, in exacerbation of social and economic contradictions. Traditional state structures lose control over processes in society and economics, and are faced with inefficiency in conflict resolution. From the point of view of the theory of anti-crisis management, the main cause of crises is inefficient management. This category can be applied to errors and crimes of the old ruling elite, as well as shortcomings or excesses in innovations, psychological transformations and fluctuations in the minds of people in the process of their evolutionary development.

According to systems theory, in the case of management crisis, there are four stages:

1) internal stresses intensify within the externally balanced structure of society, creating conditions and opportunities for open detection of conflicts;

2) resolving conflicts through compromises loses its effectiveness, since state structures, forms and methods of management do not correspond to the new state of the socio-economic system.

Deinstitutionalization of the system is observed, which means violation of the normal functioning of social institutions, such as enterprises, firms, money, wages, pensions and others;

3) exacerbation of the crisis and the emergence of prerequisites for its stopping (at this stage the delegitimization of the system is completed, that is, many illegal processes are massive, the old power and political structures break up, the authorities lose the ability to govern);

4) the formation of new goals of the system and ways of their achievement, there is an awareness of the opportunities to get out of the crisis (programs of crisis are being developed, the strategy and tactics of achieving goals are formed, the natural tendency of the social system to self-preservation is developing, the development and implementation of exit programs is being activated and new the rules of the game are being created.

It is important to note that the crises of the present are different from those that have taken place in the past centuries. The causes and nature of crises evolve that influences the need to adapt strategies for anti-crisis management. Researching countries such as France, Italy, Spain, Portugal, USA and Korea, we have received unique models of anti-crisis strategies. Each country has its extensive experience in overcoming crisis, however not all of them have effectively coped with these tasks. For example, France, which is currently experiencing a difficult crisis. Despite this, managers in the French system do not stop finding new methods of overcoming the crisis. This indicates the importance of constant analysis and adaptation of management strategies, as crises become more dynamic and complex.

Methods that are more effective are determined by the state itself. This may include effective financial regulation, implementation of social measures, support of businesses and the population, as well as active participation in international economic and financial organizations. This requires strategic planning, flexibility and ability to be adapted to changes, ensuring the stability of the economic system in the conditions of adverse factors.

Thus, it can be stated that the essence of crises depends on the economic structure and the predominant spheres of the state. At the stage of modern economic development of the crisis, the result is the imbalance between the real and financial sectors of the economy and poor control over the turnover of speculative capital.

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THE ROLE OF EMOTIONAL INTELLIGENCE IN THE PROCESS OF LEARNING A FOREIGN LANGUAGE USING WEB TECHNOLOGIES

The accelerated pace of life of modern youth, fierce competition in the labor market, the desire for social prestige, the search for their own life prospects, and the barrage of various information are the factors that keep people under stress. Intense emotional stress leads to nervous disorders and interferes with rational thinking. However, emotions accompany any human activity, including cognitive. Learning through experience can be more productive than forced memorization of certain facts. It is emotions that motivate us to take further action [1, p. 112]. It works in the same way when learning a foreign language. Intellectual and emotional processes are interconnected in human activity. An important task for psychology is to understand the interaction of cognitive and emotional processes, as well as to determine their positive or negative impact.

The concept of “emotional intelligence” in foreign language learning is a complex construct. We are inclined to believe that emotional intelligence is a set of mental abilities. It is an important integral characteristic of a personality that manifests itself in his or her effectiveness in learning a language, understanding emotions, generalizing content, regulating emotions in such a way as to positively influence the cognitive activity of learning a foreign or any language and overcoming negative emotions that can interfere with communication or hinder one's own success [3, p. 23].

The use of web technologies in English language learning supports interest in the language, visualizes learning material and helps students expand their knowledge of a particular topic. Computer-assisted learning in English classes is based on the following principles:

1) individualization (the ability to work with each student individually, taking into account their abilities, level of knowledge, skills and abilities);

2) differentiation (you can choose and offer students the necessary options for learning tasks of a certain complexity and number);

3) intensification (there are various means of presenting educational material, structuring it with a wide involvement of interactive types and forms of work) [2, p. 2].

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PECULIARITIES OF NON-EQUIVALENT TOURIST VOCABULARY TRANSLATION

Despite the impossibility of achieving full identity when translating non-equivalent lexical units, their transfer can be carried out with a number of techniques. The most common methods include transcription, transliteration, calculations, descriptive or explicit translation, approximate translation and transformation translation [1].

Some lexical and grammatical transformations should be used for translation: replacement of part of the language, lexical replacement, explication and/or decompression of individual components (*family accommodation* – проживання в сім'ї, *capsule hotel* – капсульний готель, *on-line booking* – замовлення квитків через Інтернет, *child friendly* – безпечний для дітей, *recreational facilities* – місця відпочинку та розваг, *central park of culture and leisure* – центральний парк культури та відпочинку – *Central Park of Culture and Leisure*, *excursion of scenic spots of TV series* – екскурсія місцями зйомок телевізійного серіалу – *city tour following the scenery of TV series*, *worldwide journey* –

around-the world journey). In some cases, the replacement of individual lexical units of the original language is justified by lexical units of translation, which are not their vocabulary equivalents. Most often there are specification and generalization [2]. Specretization – replacement of lexical units of the original language of broad importance, lexical units of translation language with a narrower meaning (*святкові та пам'ятні дати – world, national and city holidays; meal – сніданок, обід, вечеря; туристичне спорядження – camping outfit*). Generalization – replacing a unit of original language that has a narrow meaning, a unit of translation language with a wider value (*Меморіальний музей квартира сім'ї Гризодубових в місті Харків – Harkiv's Gryzodubov Family Museum, санаторій – health resort, будинок відпочинку-турбаза – holiday resort, туристичний похід – walking tour*).

An explicit translation means the disclosure of the meaning of an equivalent lexical unit by means of a detailed phrase to ensure optimal interpretation of such a unit. Example: *host culture – культура країни перебування, “slow travel” – подорож з відвідинами меншої кількості місць з більш тривалим перебуванням, destination – туристичний напрямок, В&В – готель типу «ліжко та сніданок», travel sickness – непереносимість їзди в автотранспорті, fortnight – два тижні*. In some cases, the disadvantage of this method is the loss of national and cultural specificity of the output unit (*народні гуляння – street festivities, globe trotter – людина, яка багато подорожує світом*). Approximate translation is to find in the language of translation of the closest in value of the correspondent, or the so -called analogue for a foreign language lexical unit (*city guide – міський туристичний портал, off-season – мертвий сезон, high season – розпал сезону*). Despite the fact that the correspondent in the language of translation may not coincide with the original concept, it still has a significant semantic similarity and reveals the essence of the phenomenon described for the recipient (*business trip – відрядження*). Thus, the choice of translator methods of transmission of non-equivalent lexical units is usually dictated by certain linguistic and extralinguistic reasons, including preserving the awareness of the original unit and its national-cultural specificity, accuracy and completeness of information transmitted during translation.

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HISTORIOGRAPHIC IMAGES OF HISTORIAN-GERMANIST ANATOLY ZAVYALOV

Anatoly Sergiyovych Zavyalov (1927–2003) is a Soviet and Ukrainian historian. He studied the processes of socialist construction of the GDR and the civilizational development of the countries of Eastern Europe and the GDR. A. Zavyalov is quite famous as the founder of the scientific school of German studies at Dnipropetrovsk University. He was the chief editor of the collection "Questions of German History". This is an unusual and outstanding personality. For a broader understanding of what A. Zavyalov was as a person and an intellectual, it is important to consider his self-presentation and various responses from his students and colleagues to build a more complete picture.

First, it is important to reveal the content of A. Zavyalov's thoughts about himself. The quote is telling: "After graduating from Kharkiv University, I received an offer from the dean of the Faculty of History to stay in graduate school at the Department of the Middle Ages. But I chose a different choice: to teach history in the city of Ostroh. After my parents said their parting words, I left my native penats to find myself in a world that preserved the priceless features of true, unruffled and uncouth Ukraine. And I was not mistaken. Many years later, I was ready to repeat this metamorphosis again: to move from the largest industrial center to a place where historical traditions, the mentality of the population, architecture, nature – everything is wrapped in the romance of past centuries, where the memory of not only revolutionaries and statesmen of the 20th century is honored (in D. Manuilskyi studied at the Ostroh gymnasium, the family of A. Gromyko comes from Ostroh), as well as state and cultural figures of past centuries (princes of Ostroh, first printer I. Fedorov, etc.)." [4, p. 29–30]. These reflections illuminate A. Zavyalov as a person who is "in love" with the past, sees the latter as a crucial element of his own life, and for him such concepts as "history" and "historical science" are not something secondary and passing. And that's why A. Zavyalov chooses not just a typical Soviet city for his time to live and work, but the city of Ostroh, steeped in history. In A. Zavyalov's words, one can trace his distaste for excessive promotion to the history of the October Revolution and other events from

Soviet history by the authorities. It led to obscuration of equally important historical events of the past. A. Zavyalov was initially directed to work in Kharkiv, where the influence of the Soviet government was especially felt, he, feeling the urge to deepen his awareness of himself as a historian, went to Ostroh— a place where this influence would be less.

And what are the external assessments of A. Zavyalov's activity? He is remembered as a teacher with a coherent and clear presentation of educational material. As noted by the historian K.A. Markov, "the latest history was read to us by Anatoly Sergiyovich Zavyalov. Later, my supervisor. But he had a different manner, he was so restrained, dry: arguments, facts and left" [1, p. 229]. S. M. Plokhii notes A. Zavyalov as an effective organizer [2, p. 13].

According to V. Ivanenko, in all positions he was characterized very positively, emphasizing his exceptional organizational skills, professionalism, responsibility for the assigned task, scrupulousness and perseverance during the performance of production tasks, the ability to listen and, most importantly, hear the interlocutor, a simple citizen – worker, willingness to come to help [5, p. 51]. Professor V. Ivanenko highlights that A. Zavyalov played an important role in the professional training of historians at Dnipro University, made a significant contribution to the development of German studies, and strengthened the image of the university both within the former USSR and abroad.

V. Ivanenko points out that A. Zavyalov was not purely a "party historian" and was not a "mouthpiece of the government". He mentions that, despite the limitations of those times, "most historians of that unique, controversial and dramatic era (and A. Zavyalov among them) honestly and conscientiously served their chosen profession, "digging" the past, looking for a way to the truth not through the behind-the-scenes ideological "guidelines" of party officials, but through scrupulous analytical work, by processing huge arrays of documentary materials, concentrated in various domestic and foreign archives" [5, p. 52].

A. Zavyalov is evaluated as a scientist with a thorough approach to research. In general, the reviewers state that A. Zavyalov's monographs are organically connected, but at the same time they differ from the previous works of a similar direction by posing and solving an independent scientific problem, highlighting "the mechanism of interaction of the allies of the working class within the framework of

the National Front and the Democratic Bloc" [3, p. 152]. It is worth noting that A. Zavyalov knew the German language and having connections with Germanists throughout the USSR. As a result, in all his works of the 1970s and 1980s, A. Zavyalov relied on a new source base, which almost exclusively consisted of original primary sources [6, p. 276].

At the beginning of the 1990s, a gradual change in the problems of A. Zavyalov was observed. On the one hand, it connected with the political situation of the country, and, on the other hand, with the revision of the scientist's internal worldview [6, p. 276]. In the 1990s, the staff of the Department of World History of Dnipro University began to investigate issues connected with history of Germans on the territory of Ukraine. The first work that was devoted to this topic (the history of Germans in Ukraine) and from which the "reorientation" of the entire department of world history begins, was a joint article by S. Gilts and A. Zavyalov "The socio-political situation in the German settlements of the Dnieper region in the mid-20s and the activities of local party Soviet bodies", which was written based on the materials of the Dnipropetrovsk party archive [6, p. 277].

A. Zavyalov is an outstanding German historian, who was a professional person with his scientific views, and loved his own craft as a historian. He underwent professional evolution and was able to find his place in historical science after the collapse of the USSR.

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FEATURES OF COMMUNICATIVE AND SPEECH DEVELOPMENT OF PRESCHOOL CHILDREN

Speech communication is one of the first activities that a child masters in ontogeny. This is a universal requirement for personality development in preschool age. In the process of communication during the game, the child learns the integrity and diversity of the surrounding natural, object and social world. It forms and reveals the image of its own inner world, assimilates and creates cultural values, thus acting as an active object of exchange.

The communicative need is formed based on the child's experience of interaction with the people around them. In this case, the social behavior of adults is of particular importance, as they initially treat the child as an object of communication, as an equal partner, and at the same time encourage the child to acquire communication skills. Scientists have come to the conclusion that communication and the need for communication are formed at approximately the same time, and the starting point in both cases is the identification of adults as objects of special activity for children.

T. Pirozhenko, on the basis of experimental studies of the peculiarities of the development of communicative and linguistic abilities of preschool children, identified the level of social, cognitive and linguistic abilities of children from 3 to 7 years old. The signs of such development are:

- communicative properties of the language (focus on the partner, indication of the appropriate response, variety and expressiveness, active use of non-verbal means of communication, contact in communication);

- cognitive properties of language (child's understanding of the spatial and temporal features of the communication situation, understanding of the emotional content of the situation);

- linguistic characteristics of the language (richness of vocabulary, correct grammar, declension and agreement of words in phrases in accordance with language norms);

- arbitrariness of speech (the desire for completeness, logic, consistency, ensuring understanding of one's own speech, control of speech, changing the language, if necessary) [1, c. 4].

T. Pirozhenko considers the age-related achievements of children of junior preschool age to be an orientation to a person, communicative orientation and activity, individualization and variety of expressive and mimetic means. Preschool children are believed to experience gradual qualitative changes in verbal behaviour, which are associated with a change in the communicative personality, the development of communication needs and forms of communication. The directionality and appropriate instructions to the partner determine not only the readiness for communication and the ability to participate in interpersonal processes, but also contribute to the development of arbitrariness of statements [2, c. 28].

The development of a high level of communicative and linguistic abilities in preschool children is characterized by the fact that the child understands words, actions, characteristics, categories, the semantic field is normal. Children's speech is accompanied by a smile, expressive intonation, understanding of various elements of the partner's non-verbal behaviour and frequent use of non-verbal means of communication.

The average level of communication abilities and language development of a preschool child is due to the fact that the child correctly uses metaphors, correctly uses descriptive symbols and emphasizes the essential features of an object with the help of adults. The child clearly explains the request. When addressing peers, a child says them his name, looks at them attentively, listens to the answer, speaks to them in a friendly manner.

The low level of communicative and linguistic development of preschool children is due to difficulties in recognizing phonetic content by ear, difficulties in transitioning from one syllable to another, and difficulties in understanding grammatical categories by analogy. The contact-establishing means are weakly expressed. A child expects adults to judge him/her, does not know what behaviour adults expect from him/her, seeks an adult's affection [2, c. 12].

In this manner, communicative and speech development is seen not only as a process of formation of forms and means of interaction of the child with the environment, which reflects the formation of the emotional-volitional, cognitive, personal sphere of a person as a subject of communication, but also as a process of forming child speech skills. The communicative and speech development of a preschool child is a set of interrelated components: speech and communication development of the child, peculiarities of family communication with the child.

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Ye. Hetman, N. Yuzikova

IMPACT OF GLOBALIZATION PROCESSES ON ENVIRONMENTAL CRIME

The dynamics of social processes over the last decades have solidified the status of globalization as one of the leading factors influencing all spheres of human life.

The modification of crime, the emergence of new techniques and methods of conducting criminal activity on the international level, are traditionally associated with globalization and in connection with it, the scientific investigation of this phenomenon is highly relevant.

It is believed that the concept of «globalization» was first mentioned in the article by T. Levitt «The Globalization of Markets» in 1983, by which he meant the process of merging markets for individual goods produced by large transnational and multinational corporations, although H. P. Zharovska notes that the term «globalization» had appeared in one of the American dictionaries already in 1951 [10] [17, p. 354].

Yu. V. Kovbasiuk considers globalization as a worldwide trend where factors, principles, and tools for accelerating global development are identified [8, p. 7–8].

V. O. Zozulia defines globalization as a multifactorial process that influences the spheres of public life and the system of state governance, promoting unified values and directions of activity based on democratic governance [18, p. 17].

R. Robertson provided a definition of this term as «the comprehension of the world and the heightened perception of the world as a single whole» [15].

M. Albrow and E. King define globalization as «all those processes by which the peoples of the world are incorporated into a single world society» [6, p. 8].

Summarizing the reviewed definitions, we can come to the conclusion that scholars predominantly view globalization as a process leading to multifaceted global integration.

Recognizing the role of this phenomenon, the United Nations General Assembly in its resolution dated December 19, 2016, «Globalization and its impact on the full enjoyment of all human rights» A/RES/71/197, noted that globalization is not merely an economic process, but that it also has social, political, environmental, cultural and legal dimensions, which have an impact on the full enjoyment of all human rights and fundamental freedoms [5].

In the National Security Strategy of Ukraine «Human Security – Country Security» approved by the Presidential Decree of Ukraine on September 14, 2020, № 392/2020, globalization is mentioned as a factor that facilitated the spread of international terrorism and international crime, including in cyberspace, drug trafficking, human trafficking, religious and ideological fundamentalism and extremism fueled from abroad, separatism, illegal migration, legalization (laundering) of criminally obtained incomes, proliferation of weapons of mass destruction, etc. [12].

Globalization is also mentioned in the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period up to 2030, approved by the Law of Ukraine on February 28, 2019, № 2697-VIII, in the context of acknowledging the fact that this phenomenon has increased the priority of environmental conservation and has necessitated the state to take urgent measures [1].

For the sake of objectivity, it should be noted that scientists also pay attention to the positive aspects of globalization, which include the improvement of interstate relations, increased transparency of borders, the development of world trade, the increase in the volume of international transportation, and the expansion of international labor markets [17, p. 356].

According to Yu. Ye. Kyrylov, globalization and integration processes for most countries satisfy their economic needs and realize certain interests, but simultaneously, they destroy the conditions for meeting the ecological needs of society. In order to prevent such an impact, it is appropriate to require the ecologization of relations between countries in the process of globalization and integration of countries [9, p. 291].

Lukianykhina O. A. and Bohatyrenko V. V., considering the impact of globalization processes on environmental security, believe that the key problems include climate change, global warming, the processing of waste from production and human activities, transnational pollution of the atmosphere and water resources, the destruction of fertile soils, problems of shortage and reduction in the quality of

drinking water, etc. At the same time, it is quite important to focus on the impact of globalization processes on the ecological state in the countries experiencing such an impact, determining the state of environmental security of the countries involved in the globalization process of the economy [11, p. 70].

As H. S. Yuzikov emphasizes, the ecological consequences of globalization processes, which are inseparably connected with the economic component of globalization, are important [16, p. 59].

The researcher points out that the environmental security of society under globalization means the safe development of the «humanity–biosphere» system. Ignoring the rules of coexistence in nature and a respectful attitude towards it will lead to an increase in the planet's temperature, the so-called «greenhouse effect», the depletion of the ozone layer of the atmosphere, and the deformation of human genetics [16, p. 59–60].

Within the scope of this publication, we are interested in the question of the impact of globalization processes on environmental crime, L. I. Arkusha and N. O. Fedchun, revealing the determination of crime in Ukraine, note that globalization is a factor that has a significant criminogenic impact on crime [2, p. 44].

In studying environmental crimes as the «dark side» of globalization, I. Çetin, H. Y. Keser, and S. Ay draw attention to the fact that modern technology has significantly reduced time and space limitations, damages caused to the environment are increasingly adding up; these negative impacts on the environment and nature have become globalized in nature. The manufacturing industry may have increased productivity, but in so doing the people involved have caused the destruction of forests, the accumulation of waste, and climate change with their own hands [3, p. 161].

A review of materials related to the topic of this publication allows us to conclude about the existence of sufficiently thorough studies on the state of environmental crime, both at the international level and at the level of Ukraine.

According to the data from the World Atlas of Illicit Flows prepared in 2018 by RHIPTO, INTERPOL, and GI, environmental crimes are considered some of the most profitable crimes globally, generating approximately between 110 to 281 billion US dollars annually [14, p. 15].

In the FATF (2021) report «Money laundering from environmental crimes» (using research data from D. P. Uhm and C. C. Nijman, 2020), it is noted that criminal activities in the forestry sector, illegal mining, and waste trade account for 66%

of the income from this activity. Environmental crime has far-reaching impacts beyond the financial cost, including for the planet, public health and safety, human security, and social and economic development. It also fuels corruption, while converging with other serious crimes such as drug trafficking and forced labour [4, p. 7].

In a scientific article dedicated to the study of the current state and trends of environmental crime in Ukraine, T. V. Korniakova, N. S. Yuzikova, S. I. Khomiachenko emphasize that environmental crime (crimes against the environment) is a socially dangerous phenomenon of irrational, destructive human attitude towards the environment, manifested as a multitude of criminal incidents against the environment that threaten the stability of ecological relations and the integrity of physical and biological resources [7, p. 153].

As noted in the study, environmental crime, due to its essential characteristics, is in many respects economic (illegal use of natural resources), violent (associated with direct harm to human health), or selfish (illegal hunting, illegal fishing, illegal logging, illegal mining, etc.) crime. The commission of environmental crimes causes not only material damage but also harm to public health. In Ukraine, this occurs through the pollution of water bodies and subsoil with radionuclides, which promotes the spread of cancer diseases; poor drinking water causes diseases of internal organs, polluted air leads to lung diseases, and consuming poor-quality food leads to other diseases [7, p. 154].

Y. V. Orlov and Y. V. Stupnyk, conducting a criminological analysis of environmental crime in Ukraine, provide data that the absolute majority of criminal offenses against the environment are constituted by illegal logging or illegal storage, sale of timber (Art. 246 of the Criminal Code of Ukraine), with their percentage among such offenses increasing from 336% to 528% over the examined period. In 2013–2014, about 1000 such cases were detected. After a very significant increase in 2015–2016 to 2313 (23 times), the number of these offenses decreased slightly over the next three years, and in 2019 it equaled 1961 (-152% compared to 2016). In 2020–2021, there was again an increase in these cases, first by 302% and then by another 121%. In 2021, 2862 criminal offenses were recorded. In 2022, there was a moderate decrease to 2454. Analyzing statistical data, scientists note that the dynamics of environmental crime, despite periodic fluctuations, demonstrate a general and very significant trend of growth [13, p. 284].

The publications reviewed allow us to come to the conclusion that despite the presence of scientific interest in the issue of the impact of globalization processes on ecology and crime, the question of studying their impact on environmental crime, particularly in Ukraine, remains under-researched. In the context of the need to develop a new effective state strategy for preventing crimes against the environment, the research of the positive and negative aspects of the impact of globalization processes on the environmental crime in Ukraine requires further thorough investigations.

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V. Hovorukha, O. Hurko

THE RESULTS OF THE PHILANTHROPIC ACTIVITIES OF THE AMERICAN RELIEF ADMINISTRATION IN THE KATERYNOSLAV GUBERNIA DURING THE FAMINE OF 1921-1923

The emergence of a mass famine in Soviet Ukraine, and the authorities' inability to cope with its growing scale and catastrophic demographic consequences caused significant international resonance, a broad movement to support the starving population, especially after V. Lenin's appeal, cultural figures, and the church to the world community for help. However, the focus was on the Volga region and other Russian territories, and the Ukrainian famine until the end of 1921 seemed non-existent. Real international assistance to Ukrainian territories, including the Katerynoslav region, can only be discussed from 1922 when the Kremlin finally officially acknowledged the famine [4, p.25].

The American Relief Administration worked in the territory of the Katerynoslav gubernia from January 1922 to July 1923, concentrating its efforts on combating

famine, epidemics, and destitution among residents [5, p. 215]. For this purpose, an optimal organizational structure of the ARA was built, with management bodies, personnel support, and a network of local branches covering practically all and especially densely populated areas of the province. Initially, assistance was primarily provided to children regardless of their nationality or social affiliation, but as the catastrophic famine situation worsened, support for adult population also began [1, p. 271].

The main directions of the American Relief Administration's work included: opening and maintaining public canteens for needy citizens (over 600 were created in total); providing food, clothing, and medicines to orphanages; organizing delivery from abroad and distributing food and material parcels in the region; implementing medical assistance to the population and equipping hospitals with necessary instruments, medications, and supplies. According to the agreement with the government, meals in the ARA canteens were supplementary, meaning that individuals receiving ARA rations could not be deprived of state support intended for the local population. Therefore, the nutritional value of a child's lunch, for example, was only 670 calories [2, p.10]. However, in practice, this small portion from ARA often became the only person's source of energy for the entire day. In the summer of 1922, over 360,000 people in the province were fed in this way. Out of the total amount of food aid sent to Ukraine in August 1922, 16% of child and 25% of adult feeding by the ARA were allocated to the Katerynoslav gubernia. Additionally, a lot thousand pairs of shoes, socks, and clothing items were provided to children by the ARA. Childcare facilities were largely supported by ARA funds [3, pp. 86–87].

The medical program of the ARA, from which the Katerynoslav region got 6% of the total volume of medical goods imported into Russia, was unique in many respects and tailored to the needs of the time. Conducting an independent policy, the ARA determined who to prioritize assistance to, typically targeting the most socially vulnerable categories of the population: children, orphans, medical personnel, patients in hospitals, students, scientists, artists, educators, clergy, and others [6, p. 51].

The American Relief Administration did a lot to support the starving population, especially children. It left a lasting impact on the collective consciousness of the residents of the Katerynoslav gubernia, despite subsequent attempts by the Kremlin to discredit, belittle, and even denigrate the aid provided during the hour of our nation's famine.

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K. Hromtsev, Yu. Honcharova

ORGANIZATIONAL CULTURE OF MEDICAL INSTITUTIONS: PECULIARITIES OF FORMATION

The organizational culture of medical institutions is a key element that determines the effectiveness of their functioning and interactions with both patients and staff [1]. Each medical institution develops its unique approach to organizational culture, which affects the quality of healthcare services and satisfaction of both patients and medical personnel. This approach can be observed in the marketing tools used by the institution to promote its services [9], in the stories told about the institution [8], in the organization of the institution's business processes [5], and in other manifestations. The study of the peculiarities of forming the organizational culture of medical institutions is driven by the need to improve the efficiency of healthcare services, understand and address the specific requirements and challenges faced by healthcare workers in our country [6, 10]. In the context of the constant development of medical science and technology, organizational culture becomes a key factor in adapting medical institutions to the new requirements and standards in the field of healthcare. Besides, the organizational culture of the institution is a determining factor in achieving profitability [2].

Research on organizational culture as a phenomenon and its implementation in medical institutions demonstrates various approaches. Some studies emphasize the importance of leadership and communication in shaping culture, while others identify the role of values and ethical principles. It is also important to consider gender, ethnic and sociocultural influences on the formation of organizational culture in medical institutions. Another important aspect is the interaction among different professional groups in medical institutions, as each has its own characteristics and professional responsibilities. We adhere to the following definition: "Organizational culture is defined as a certain set of values and norms that are common by individuals and groups within an organization, as well as the way they interact with each other and with stakeholders outside the company" [2, p. 36]. In this context, studying and analyzing existing approaches to forming organizational culture in medical institutions becomes a crucial prerequisite for improving management and enhancing the quality of healthcare services. Peculiarities of formation of organizational culture of medical institutions [3; 4; 7]:

1. Recognition of the importance of ethical principles and understanding among different groups of medical personnel.
2. The role of leadership and communication as key factors in forming a favorable work environment and teamwork.
3. Consideration of the specific nature of work in medical institutions, where a high level of stress and responsibility can affect team dynamics and the quality of service delivery.
4. The provision of support and psychological safety for medical personnel as an important aspect of culture formation.
5. Interaction among different professional groups in medical institutions and consideration of their specificities and professional responsibilities.
6. Directing efforts towards creating a positive image of the medical institution.
7. Creating conditions to increase the loyalty of employees and patients to the medical institution.

Thus, the organizational culture of medical institutions, based on leadership, communication, and ethical principles, is a determining factor for the successful functioning and satisfaction of both patients and medical personnel. Understanding

these aspects facilitates effective management. It is strategically important for improving the quality of healthcare services and ensuring the comfort and satisfaction of medical personnel in their work. Researching the peculiarities of organizational culture in medical institutions is a strategically important step towards improving the healthcare system. Considering specificities and optimizing management practices in this direction enhance the quality of healthcare services, ensuring the effective work of personnel, and improving satisfaction with received medical assistance.

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**RUSSIAN-UKRAINIAN WAR FROM THE PERSPECTIVE OF
INTERNATIONAL PHOTOJOURNALISTS:
PERCEPTION AND EXPERIENCE**

The Russian-Ukrainian War has not only been a significant geopolitical event but also a profound humanitarian crisis that has garnered international attention. Among the chaos and conflict, the role of photojournalists has been pivotal in documenting the realities on the ground. This article delves into a series of oral history interviews with professional journalists and photojournalists, providing a nuanced exploration of their perceptions and experiences during the first year of Russia's full-scale invasion of Ukraine. Through journalistic reconnaissance and academic research, this article aims to systematically organize information regarding the mediatization of oral testimonies in the context of wartime. The article was conceived with the intention of documenting the memories and experiences of professional journalists who found themselves on the frontlines and in regions engulfed by war. Additionally, it seeks to elucidate the role of journalists in conflict zones, their capabilities, and the constraints they face in their professional endeavours. Interviews with journalists may encompass discussions about their experiences and impressions of the events unfolding, the conditions of their work, methods of information gathering, as well as the challenges they encountered. The article's research objectives include characterising the fundamental principles of oral history interview technology and memory mediatization, developing questions, conducting in-depth interviews, gathering and systematizing the experiences of war journalism, the coverage of Ukrainian events by foreign media outlets, and issues related to ethical, security, and journalistic standards during wartime, particularly in Ukraine.

There are a number of fundamental differences between an in-depth oral history interview and a conventional journalistic interview, which should be noted separately. The difference lies in their goals, approaches to implementation, volume and nature of the information received. "The term 'oral history' refers to a qualitative research process based on personal interviews that allows us to understand meanings, interpretations of connections and subjective experiences, as well as

a product (audio or video recording) that is a genuine historical document, a new primary source for further research”[3, p. 10–15]. An in-depth oral history interview is aimed at collecting detailed personal testimonies and experiences of people regarding specific events, period or phenomenon, in our context this is the Russian-Ukrainian full-scale war. The main goal is to record testimony from the primary source, to preserve information that may be lost or underestimated. It is usually used in scientific research, ethnography, archival work, where it is important to preserve and transmit authentic evidence about the past. A typical journalistic interview focuses on obtaining information for mass media publication. The focus is on issues related to current events or surrounding public discourse. This type of interview often has a more formalized approach with shorter interview time. Highlights a mostly one-way process in which the journalist asks questions, and the interviewee answers them. Usually, short questions and answers aimed at a wide readership or listening audience.

Vudi Xhymshiti, Christopher Parker, Wolfgang Schwan, Patrick Patterson have already joined the project. Vudi Xhymshiti, a famous Kosovar-Albanian photojournalist living in London, during the interview talked about his own experience of wartime journalism, his vision of the war in Ukraine in the Balkans, how it affects European countries, whether this war can change international institutions, and whether it will affect the future of collective security. With over sixteen years of experience covering armed conflicts and political unrest, the photojournalist’s work has been published in such respected publications as *The Guardian*, *The Times*, *Der Spiegel*, *The New York Times* and *TIME Magazine*. Christopher Parker is an independent journalist and photographer from the USA. He is a graduate of the Craig Newmark School of Journalism at the City University of New York, where he studied documentary filmmaking and international reporting. Now he reports on Ukraine. His works were published in *The Nation*, *openDemocracy*, *Euromaidan Press*, *The Jerusalem Strategic Tribune*. In the interview, they talked about the reporter’s experience during the war in Ukraine, as well as freedom of speech, the role of journalism in times of crisis, the politics of the Republicans in the USA, social transformations in Ukraine and the future of Ukrainians. Wolfgang Schwan is an American documentary photographer who lives in Philadelphia. Member of the National Press Photographers Association (NPPA) and The Curious Society. He works as a photojournalist for ‘Anadolu Agency’. The photograph of

Olena Kurylo, injured as a result of Russian shelling, which was taken by Wolfgang Schwan on February 24, 2022 in the city of Chuhuiv, Kharkiv oblast, became one of the symbols of the Russian-Ukrainian war and was on the front pages of the world media. Therefore, from this photo, the American portrait artist Yevgenia Hershman painted a portrait, which was later sold at an American auction for 100 thousand dollars. The proceeds were used to help the Armed Forces and the National Guard of Ukraine. The photos were published by *The Washington Post*, *The Wall Street Journal*, *Telegraph*, *New York Times*, *LA Times*, *The Economist*, *1843 Mag*, *New Yorker*, *National Geographic*, *Vanity Fair*, *The Atlantic*, *Time*, *The Times*, *The Literary Supplement*, *The Irish Examiner*, *The Saturday Paper*, *The Arab Times*, *Bloomberg*, *The Guardian*, *Al Jazeera*, *BBC*, *CNN*, *Die Zeit*, *People*, *Il Foglio*, *Philadelphia Inquirer*, *Axios*, *VICE*, *Business Insider*, *The Week* and *Grid Magazine*.

In conclusion, the research project focuses on documenting the memories and experiences of journalists who worked during the Russian-Ukrainian War, aiming to preserve valuable historical information for future generations. By conducting in-depth oral history interviews with journalists such as Vudi Xhymshiti, Kristopher Parker, and Wolfgang Schwan, the project sheds light on the challenges faced by reporters on the frontlines and their contributions to shaping public understanding of conflict. Through these interviews and scholarly research, the article seeks to explore the differences between journalistic interviews and oral history interviews, while also examining the impact of mediatization on the perception and preservation of wartime memory.

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PANICKED ATTACKS DURING WAR: THE IMPACT OF STRESS ON MENTAL HEALTH

War, with its harrowing realities and constant threats, serves as a crucible for testing the resilience of individuals and communities. Amidst the chaos and turmoil of conflict, one of the most insidious adversaries' soldiers and civilians alike may face is the onset of panic attacks. These episodes, characterized by sudden and overwhelming feelings of fear and distress, can have profound implications for mental health in wartime scenarios.

The human psyche is intricately wired to respond to danger, and in times of war, this primal instinct is frequently activated. However, the prolonged exposure to stressors inherent in armed conflict can disrupt the delicate balance of mental well-being, leaving individuals susceptible to debilitating panic attacks [2]. Understanding the mechanisms underlying these attacks and their repercussions is essential for addressing the broader mental health challenges posed by war.

In the crucible of war, individuals facing the specter of panic attacks often find themselves grappling with a myriad of challenges. From soldiers on the front lines to civilians caught in the crossfire, the toll of constant danger and uncertainty can be profound. However, amidst the chaos, there exist coping strategies that can serve as lifelines for maintaining mental resilience.

One such strategy is mindfulness-based techniques, which encourage individuals to cultivate present-moment awareness and acceptance of their emotions. By grounding themselves in the here and now, individuals can create a buffer against the onslaught of panic-inducing stimuli, fostering a sense of calm amidst turmoil [3].

Additionally, social support networks play a crucial role in bolstering psychological resilience during wartime. Whether it be camaraderie among fellow soldiers or the solidarity of community bonds, the presence of supportive relationships can provide a vital lifeline for individuals navigating the tumultuous waters of war.

Furthermore, psychoeducation initiatives aimed at increasing awareness of the signs and symptoms of panic attacks can empower individuals to recognize and address their psychological distress proactively. By equipping individuals with the knowledge and skills to navigate their emotional landscapes, psychoeducation

serves as a cornerstone for promoting mental well-being in conflict-affected populations [1].

In the crucible of war, the specter of panic attacks looms large, casting a shadow over the mental well-being of individuals and communities. Yet, amidst the chaos and uncertainty, there exists a glimmer of hope – a testament to the resilience of the human spirit.

In closing, let us remember the resilience and strength inherent in the human psyche – a beacon of hope amidst the tumult of war. As we forge ahead, may we remain steadfast in our commitment to promoting mental well-being and building a future where peace and tranquility prevail.

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D. Kolot, O. Hurko

THE INFLUENCE OF DIGITAL DIPLOMACY ON THE POLITICAL PICTURE OF UKRAINE

Digital diplomacy is an important tool in modern Ukraine, which is used to change the country's political landscape. It consists in the strategic use of digital technologies in order to increase the effectiveness of foreign policy and communication at the international level. Digital diplomacy transforms traditional approaches to diplomacy, providing new opportunities and changing ways of interacting with other countries and the public. Scientist M. Holmes defined digital diplomacy as the evolution of traditional diplomatic practices in the context of the digital era. It includes the use of social networks, electronic communication, big data analysis and other digital tools to communicate with the public and other countries. Ukraine, facing geopolitical challenges, uses digital diplomacy to activate its international presence

and solve problems at various levels. It uses social networks to communicate with the world, cyber diplomacy to ensure cyber security and cooperation with international partners online. Digital diplomacy provides an opportunity to quickly respond to events, influence global public opinion and expand external influence. However, it is important to take into account the challenges of digital diplomacy, such as cyber threats and excessive dependence on information technologies. Ukraine studies this topic in the context of modern challenges and opportunities, which reflects the importance of understanding the impact of digital diplomacy in the context of global changes. The use of digital tools can become a strategic asset for diplomacy and increase Ukraine's influence in the world.

Digital diplomacy, as the latest direction in international relations, has manifested itself in the era of rapid technological development. The concept of digital diplomacy arose in the 1990s and 2000s, when e-mail and the first websites began to be actively used for communication in diplomatic processes. In the period from the 2000s to the 2010s, there was a significant increase in the use of social networks, which opened new opportunities for open exchange of information and dialogue between countries. Also, this period was characterized by the emergence of big data analysis in the diplomatic sphere, which allowed countries to collect and analyze information to make informed decisions. During the years 2010-2020, the world saw an increase in the number of countries using digital tools to influence the global level. The use of cyber diplomacy, or the use of cyberspace to achieve political goals, has become a necessity in the face of cyber threats and war. Ukraine, which is in a complex geopolitical environment, felt the need to adapt to digital realities. Starting from the early 2000s and the introduction of electronic services, Ukraine actively developed its digital diplomacy, especially in the conditions of geopolitical challenges in the early 2010s. The current stage, from 2020 and later, is characterized by an even greater integration of digital technologies into the diplomatic process. Artificial intelligence is used in data analysis and event prediction. Much attention is paid to cyber defense and interaction with the public through online platforms. The general evolutionary path of digital diplomacy shows the need for constant adaptation to changes in the technological environment and global challenges, providing countries and international organizations with new opportunities for foreign policy and international cooperation.

This article examines the important role of digital tools in ensuring effective communication and shaping the image of countries on the world stage. First, it is worth noting the growing influence of social networks on diplomatic dialogue. Today's leaders actively use platforms such as Twitter, Facebook, and Instagram to communicate directly with the public and the global community. This opens up new channels for expressing countries' positions and influencing global public opinion. The second aspect is the possibility of prompt response to events and crises. The ability of diplomats to instantly express their positions or highlight official statements through social networks allows them to effectively influence the course of events and manage the country's image in real time. In addition, digital platforms are becoming an arena for conducting international dialogues and negotiations. They provide an opportunity to discuss important issues, interact with representatives of other countries and international organizations without space and time limitations. However, it is important to remember that the growing influence of social networks in diplomatic relations creates new challenges, in particular, in relation to cyber security and the spread of disinformation. It is important for states to be high-tech and at the same time protect against digital threats. In general, social networks and digital platforms are defining a new format for international communication, allowing diplomats to communicate effectively with the world and influence the global agenda through innovative technologies. In the context of digital diplomacy, the issue of cyber security becomes extremely important as states become heavily dependent on information technology. Considering Ukraine's role in this aspect, several key aspects can be highlighted. First, Ukraine, being in a state of full-scale war, is actively implementing measures to protect its cyber infrastructure. The development of own cyber capabilities and cooperation with international partners is a strategic direction for ensuring cyber security. Second, Ukrainian diplomacy actively uses cyber tools for interaction and communication in the online environment. However, with the rise of digital capabilities come new threats such as cyber-espionage and cyber-attacks.

This article explores the importance of digital media in ensuring effective communication and shaping the image of countries in the world. First, it should be noted the growing influence of social networks on diplomatic dialogue, where today's leaders actively use such platforms as Twitter, Facebook and Instagram to communicate directly with the public. This opens up new ways to express countries' positions and influence global public opinion. The second aspect is the ability to

quickly respond to events and crises through social networks, which allows effective management of the country's image in real time. In addition, digital platforms become a platform for international dialogues and negotiations, providing an opportunity to discuss important issues and interact with other countries without restrictions. However, the growing influence of social networks also creates new challenges, in particular in the field of cyber security and disinformation. The readiness of states to protect their cyber infrastructure and counter digital threats is important. In the context of digital diplomacy, Ukraine is actively working to protect its cyber infrastructure and use digital tools to strengthen its position in the international arena. Digital technologies facilitate effective diplomatic communication and conduct important events in a virtual format, which has become a key tool for cultural diplomacy. They expand the possibilities of promoting national culture and attracting attention to cultural initiatives. Digital tools are also an integral part of crisis management, ensuring a quick exchange of information and an effective response to crisis situations, for example, a pandemic. In general, digital technologies not only provide Ukraine with access to the global information space, but also actively influence the formation of international reflection and expand the circle of partners in solving political tasks. Ukrainian digital diplomacy faces significant difficulties, such as the lack of a strategic vision and personnel problems. Insufficient attention is also paid to political and cyber security, which complicates the situation in this area. The low level of digital literacy of the population and the lack of effective communication on global platforms create challenges for digital diplomacy. The analysis of the received information emphasizes the need for further research in the field of digital diplomacy and international influence of Ukraine. It is important to investigate the effectiveness of political initiatives, communication strategies and the impact of educational programs on the digital literacy of the population. Such aspects will become the basis for the development of strategies and initiatives for effective international influence.

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QUESITIVES IN THE SPEECH OF A HYPOCRITE

A speech act is an intentionally determined, grammatically and semantically organized utterance integrated with the communicative interaction of the addressee and the addresser in a certain communicative situation [3, p. 425]. A speech act that violates the sincerity condition and has a hidden perlocutionary purpose to mislead the addressee is defined as an insincere speech act. Hypocritical utterances are separate speech acts in which the speaker's hypocrisy is verbalized. Hypocrisy is pretence, discrepancy between the words and deeds of personality and his/her real feelings, beliefs, and intentions. Hypocrisy as a negative moral quality is an impetus for deception, lie, and insincerity, which are its related notions [4, p. 224].

There are various classifications of speech acts. Quite common is the classification of G. G. Pocheptsov, who distinguishes eight pragmatic types of the speech acts, namely: statements, promissives, menasives, performatives, directives, injectives, requisites and quesitives [2, p. 437–444]. The sincerity condition determines what intention (propositional attitude) is expressed by the speaker during the realization of a particular type of speech act [5, p. 159]: while actualizing assertives, the sincerity condition is that the speaker S believes that P is true, directives – that S wants the addressee H to perform action A, quesitives – that S wants to know the answer, commissives – that S intends to perform action A, expressives – that S has and wants to express the addressee's assessment, attitude or emotions.

The violation of the sincerity condition in insincere quesitives is that the speaker does not want to replenish the cognitive deficit because it is absent or unimportant for him [6]. For example:

1) ***“What are you here for?” Tracy asked. She had no interest in the answer. The important thing was to establish a friendly relationship with this woman*** [1, p. 67].

In this example, the speaker asks a question, but is not interested in the answer, so there is a violaion of the sincerity condition in this quesitive. The speaker's real goal was to establish friendly relations with the interlocutor for the purpose of further cooperation.

Thus, the quesitives of a hypocrite are the insincere speech acts with the help of which the hypocrite's communicative intentions are realized.

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D. Korobko, N. Styrnik

EXPLORING THE POTENTIAL FOR UKRAINE'S MOST EFFECTIVE FOREIGN POLICY

The priorities of any state's modern self-improvement largely depend on the foreign policy course it has chosen, as well as how clearly and unambiguously its national interests are formulated. Additionally, a clear understanding of the ways to implement security mechanisms is crucial. Among the priority objectives of sustainable development, national security in all its forms and manifestations is at the top of the priority list. The doctrine of national security is derived from the doctrine of national interests and, in a broader sense, from the universal vision of the citizens of a particular state.

The National Security and Defense Council approved Ukraine's foreign policy tactics, and on August 26, this document was enacted by a presidential order. In the context of the Crimean Platform summit and the celebration of the 30th anniversary of Ukraine's independence, this document received limited attention and did not gain wide publicity. However, it is evident that the publication of the state's foreign policy strategy marks a significant milestone. It can be argued that, for the first time, Ukraine has a comprehensive and complete plan of action on the world stage. However, it is apparent that these tactics did not emerge out of thin air. Notably, the Verkhovna Rada Resolution 'On the Main Directions of Ukraine's Foreign Policy' of July 2, 1993, alongside various other conceptual documents of national and foreign policy (2010), and amendments to the Constitution (2019) that cemented Ukraine's trajectory towards the EU and NATO. While some of these

documents belong to history, the aforementioned law is in effect but unfortunately, is hopelessly outdated.

This document provides a comprehensive regulatory framework for the principles of foreign policy, systematizes Ukraine's national interests and priorities in the global arena, identifies challenges and threats, and outlines the objectives and priorities of Ukraine's foreign activities. In its most simplified form, the main thesis of the strategy is as follows: to achieve the primary goal of ensuring the security and prosperity of Ukraine, it is necessary to re-establish peace and regional stability, effectively resist aggressor countries, achieve full membership in the EU and NATO, and promote social and economic improvement.

The strategy highlights five countries with prioritized tactical relations: the United States, the United Kingdom, Canada, Germany, and France. As the document explains, relations with these states are established based on foreign policy priorities that reflect the special nature and scale of cooperation, particularly in countering Russian aggression. This list of countries and the content of partnership with them carry geopolitical significance and utilitarian sense for a country enduring long-lasting hybrid aggression. However, the range of tactical partners extends beyond these five. According to the document, Ukraine's tactical partners include Poland, Turkey, Azerbaijan, Georgia, Lithuania, Romania, China, and Brazil. Additionally, it emphasizes a global partnership with Japan and underscores the importance of cooperation with India. Furthermore, the document stresses the priority of improving relations with neighboring states, notably emphasizing the elevation of contacts with Moldova to the tactical level. This choice is justified and pragmatic considering national interests, global realities, and the state of bilateral cooperation [1].

While there may be arguments to expand this list, it's crucial to acknowledge that there cannot be an excessive number of tactical partners, as it would dilute the significance of tactical partnership. Additionally, Ukraine faces limitations on the world stage, including diplomatic resources. This context prompts reflection on the recent period of 'multi-vectorism' in the early 2000s, during which Ukraine engaged with over two dozen countries, sometimes without clear justification as 'tactical partners'.

Secondly, the primary theme of the Strategy revolves around Russian aggression, with resistance to the aggressor state and the restoration of Ukraine's territorial unity recognized as the highest value. The document outlines a series of actions aimed at countering Russian expansion, including expanding the pool of

countries supporting Ukraine, keeping the issue of Kremlin's armed violence on the international agenda, informing society about Russia's crimes, employing various international mechanisms to counter the aggressor, and maintaining and strengthening the sanctions regime of the corporate West's responsibilities. However, it may be deemed quite risky that the section on international cooperation includes the statement that 'Ukraine's appeal to the United Nations to deploy an international peacekeeping and security operation on the still occupied territories remains on the agenda'.

An essential precondition for effectively implementing the Strategy is the concentration of political and diplomatic resources on prioritized foreign policy areas, which, figuratively speaking, would serve as the external 'engines' of the country's development. This doesn't imply that other areas or regions, such as Africa or Latin America, will be neglected. Nevertheless, it's evident that developing partnerships and cooperation, providing solidarity and support to other countries, necessitates not only general declarations and high-level visits but also significant financial and economic investments. In the modern world, pragmatism is key. Therefore, Ukraine should act pragmatically on the world stage, leveraging its own resources and capabilities. It's apparent that Kyiv operates in a different weight category in terms of political and diplomatic presence and influence on the world stage compared to capitals like Washington or Beijing.

According to the definition in the Ukrainian Diplomatic Encyclopedia, the foreign policy strategy is a "system of actual measures taken by the state to achieve the objectives of foreign policy, as well as a system of theoretical positions that regulate them" [2]. It is formed within the framework of state documents that include the doctrine of foreign policy of Ukraine or the concept of foreign policy of Ukraine. It determines the hierarchy of the state's foreign policy goals across all agencies of Ukraine's foreign policy, be it diplomatic, military, etc., and serves as the basis for the development of comprehensive programs of state processes of agencies involved in achieving certain goals.

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MODERN METHODS OF MANAGING THE STATE DEBT PORTFOLIO

For many countries around the world, the continuously accumulating public debt is considered a cause of instability. However, governments are reluctant to give up borrowing as a source of financing, especially in times of extremely high demand for public spending (war, natural disasters, economic crises).

The increase in public debt, on the one hand, is a threat that grows as a result of excessive use of the benefits of debt, and on the other hand, requires continuous prudence in the implementation of this financial policy instrument. Today, Ukraine's debt is constantly growing, which significantly destabilises the economic situation.

The problem of managing the state's debt portfolio is becoming a key issue in the development of the state's development strategy. It is an integral part of the economic security of the state and directly or indirectly influences most socio-economic processes in modern countries.



It should be noted that in Ukraine, given the urgent need to fully implement the state debt management strategy, the theoretical and practical framework for identifying risks associated with the state debt and mechanisms for managing them require substantial research and development, namely the identification of the main methods. For the effective implementation of portfolio management policy, we consider two methods of portfolio management: active and passive.

Active management involves long-term monitoring of market prices, buying the most efficient financial instruments and selling low-yielding ones as quickly as possible. This method results in particularly rapid changes in portfolio structure. The active method involves:

- sorting of financial instruments;
- analysing the profitability and risk of the new portfolio, taking into account the changes;

- calculation of the efficiency of the old and new portfolios;
- reorganisation of the portfolio, restoration of its structure.

The active method is an uninterrupted process of monitoring rates which provides an effective analysis of the current state and forecast the next quotes.

The passive method is based on the idea that the market is almost efficient in the selection of financial instruments or timing, and leads to the formation of a diversified portfolio with certain indicators of future income and risk. Therefore, changes in the portfolio composition are rare and insignificant. The main principle of the passive method is to buy and hold.

Debt portfolio management in our country is complicated by the significant share of foreign currencies in the portfolio. Debt loans from developed countries are almost entirely made in national currency. The share of debt loans in the currency of such leading countries of the global economy as the United Kingdom, Germany, France, and the United States is less than 2% of the state's debt.

Thus, a skilful balancing of active and passive methods will be most appropriate in the context of strategic and short-term management of Ukraine's debt portfolio.

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THE IMPORTANCE OF STATISTICS IN LEGAL PRACTICE

Statistics is the science that deals with collecting, analyzing, interpreting and presenting data. In legal practice, statistics is a superior method of analyzing and learning legal phenomena. In addition, statistics makes it possible to obtain both quantitative and qualitative characteristics of certain phenomenon, find out patterns of their development and make informed forecasts about the evolution of specific legal phenomena [2].

Analysis of statistics plays crucial role in shaping the political landscape, legislative process, and the structural organization of government institutions. Research of social issues and legal challenges using statistical data helps in the development of effective legislation.

Furthermore, statistical accounting of legal phenomena is of central importance of evaluating the effectiveness of government institutions, particularly law enforcement agencies [1]. One of the expected strategic results of Ukraine's National Anti-Corruption Strategy for 2021-2025 that was adopted on June 20, 2022, is to ensure a single unified system for collection, generalization and visualization of statistical information about the results of activities exercised by the National Agency on Corruption Prevention, the National Anti-Corruption Bureau of Ukraine, the State Bureau of Investigation, the National Agency of Ukraine for finding, tracing and management of assets derived from corruption and other crimes, the National Police, organs of prosecution, courts, and other state authorities [3].

Crime statistics stands as an exceedingly important element of statistics of legal phenomena. Crime statistics includes crime rates, recidivism rate, arrest rates etc. However, the main problem of crime statistics is latent criminality because statistics include only registered in law enforcement agencies acts [2]. Revealing patterns and trends in criminal activity, including crime types, locations, helps to put forward ideas about effective crime prevention measures.

As a summary, statistics of legal phenomena play a paramount role within national legal systems. By continuously improving the system of statistical accounting, we can ensure that legal institutions operate effectively, informed decisions are made, and social needs are met.

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LEXICAL VERBALIZATION OF THE "BEAUTY" CONCEPT IN ADVERTISING TEXTS

The concept of attractiveness of advertising is one of the important advertising variables that have been studied especially in recent years. The persuasive power of advertising has a great influence on the consumer to buy or prefer products and services. In particular, the advertising source is the most effective participant in the persuasion process [1]. It is often used by advertisers to capture personal characteristics such as reputation, credibility or experience, as well as physical attributes such as beauty and charm. It is indispensable for all ads to make beautiful women, men and children playing commercial from past to present.

A good appearance of the source is believed by advertisers to increase the persuasive power of advertising, increasing the attractiveness of the message, its persistence in memory and providing positive emotions to the brand. Today, the use of young and beautiful women as a source of advertising is quite common [2]. "Beauty" is a concept that has been studied by many thinkers throughout history, such as Plato and Aristotle. There is no definite conclusion regarding the point of view of beauty appreciation. There is a wide variety of opinions on whether the judgment about the beauty of an object or a person is objective or subjective.

On the one hand, there is the idea that if something is good, it is clearly visible to the person who is looking at it. On the other hand, it is surprising that beauty is not independent of human values and attitudes, and that the appreciation of beauty is related to a person's faith and moral values. Although beauty often involves the beauty of physical appearance, inner beauty has also been discussed by many thinkers. According to some researchers, such as S. Krylova, physical beauty is a static attribute [3]. Among these qualities are the beauty of the face and body, skin color, body shape, height, weight. According to researchers who argue that physical attractiveness cannot be determined by static attributes alone, physical attractiveness has both dynamic and static dimensions.

Attitude toward advertising depends on whether a consumer will be inclined to buy a product or brand when the product or brand is promoted through advertising. The consumer develops a liking or disliking of the advertisement presented to

him/her and as a result of this feeling he/she reveals a positive or negative tendency to make a purchase, this tendency constitutes the consumer's attitude towards the advertisement. Attractive designs increase the value of product-related features. It also has a positive effect on attitudes towards products and advertising.

Since people with physical charm / beauty are perceived as more charming, intelligent, talented, successful, the use of beauty in advertising creates a halo effect. Message sources with physical attractiveness and beauty communicate the ad itself to many of the positive traits associated with the brand being advertised.

Attractiveness is mainly used in the advertising of cosmetics and the fashion industry. There are other ways to employ it. Because beauty was an element that could influence people in any period of history. It is used in the advertising field, which attracts the attention of beauty and evokes positive emotions in people.

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SPEECH THERAPY IN DIFFERENT AGE GROUPS

Speech therapy is a science that studies speech disorders, their causes, and methods of overcoming them. Given that the formation of speech in children is related to the development of sensory activity, psyche, motor skills, especially small ones, from an early age, it is important to assess the development and determine the presence of speech disorders in the child.

The first stage is early-age speech therapy (from 1 to 3 years). A child listens to the human voice, responds to its different intonation color, humming appears. In the second half of the first year of life, a child begins to understand speech and listens to sounds and words. By the end of the first year of a child's life, the active

vocabulary reaches about 15 – 20 words. If a speech therapist works with the child regularly, the number of words will increase to 25-30 words [1].

The second year of life is special in the development of speech. An essential feature of this period is the lack of generalizations (the child knows separate words but does not understand their meaning).

In the third year, the child's speech life begins to acquire a coherent character. The child begins to say not only individual words, but also sentences. The child's vocabulary begins to grow rapidly: by the beginning of the third year, the child uses more than 200 words. One of the most important components of speech therapy work is early diagnosis and early complex psychological and pedagogical assistance to a child with speech disorders, the effective organization of which to a certain extent depends on the prevention of the occurrence of secondary deviations in the process of the formation of psychophysical functions [4].

At the preschool age (from 3 to six years), all types of speech disorders can be divided into two large groups depending on which type of speech is impaired: oral or written. Disorders of oral speech include dysphonia (absence or disorder of phonation due to pathological changes of the vocal apparatus), bradylalia (pathologically slowed pace of speech), tachylalia (pathologically accelerated pace of speech), stuttering (violation of the tempo and rhythmic organization of speech caused by a convulsive state of the muscles of the speech apparatus), dyslalia (sound-speech disorder with normal hearing and preserved innervation of the speech apparatus), rhinolalia (voice timbre and sound-speech disorders caused by anatomical and physiological defects of the speech apparatus), dysarthria (pronunciation disorder caused by insufficient innervation of the speech apparatus), alalia (absence or underdevelopment of language due to organic damage to language areas of the cerebral cortex in utero or early during the child's development) and aphasia (complete or partial loss of speech due to local lesions of the brain), dyslexia (partial specific disorder of the reading process) and dysgraphia (partial specific disorder of the writing) [2, c. 170].

Speech therapy of school age is of great importance. Quite a large percentage of children come to school with speech disorders. The speech therapist of the school starts working with the children having speech disorders, the presence of which leads to failure in learning educational material. In some cases, children with severe speech pathology, hearing impairment, delayed mental development, and cerebral palsy need the help of a speech therapist [3].

In this age period, the child's speech is already fully formed, his vocabulary is rich in words belonging to different parts of speech. Children can explain the meaning of words. Their speech is elaborate, common sentences prevail; they use complex syntactic constructions expressing temporal, spatial, causal relationships, etc. A child can freely talk about the events of his life, retell a story or a fairy tale, invent a sequel to them. It is not difficult to describe an object or phenomenon (for example, the seasons).

Speech disorders in adults are fairly common and widespread, they are not always easily cured. Violations of tempo, rhythmic features and fluency of speech are manifested by peculiar spasms that occur in many segments of the entire structure of the speech apparatus. A person may not control it, but involuntarily when pronouncing sounds, their forced repetition occurs. Stuttering and speech retention in adults can begin due to various physical, psychological or mental injuries.

We can come to the conclusion that it is necessary to notice the first signs of a pathology and contact a specialist as soon as possible.

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COMPETITION FOR INTELLECTUAL SUPREMACY: THE IMPACT OF MODERN TECHNOLOGY ON MENTAL HEALTH

Introduction to Modern Technology's Impact on Mental Health:
The article introduces the pervasive influence of technology on daily life and its implications for mental health. It highlights the rapid evolution of artificial intelligence (AI) and virtual reality and their transformative effects on human experiences.

Access to Information: The ability to provide fast access to information is a significant benefit of modern technology. Cognitive neuroscientist Maryanne Wolf emphasizes the potential of technology in promoting critical thinking, literacy and cognitive development, causing the **uprise** of more educated and intellectually curious society [9, p. 26]. However, concerns arise about information overload and its adverse effects on people. According to technology critic Nicholas Carr, constant exposure to digital stimuli degrades attention, has a negative impact on memory and critical thinking skills [1, p. 59]. In his research, Carr concludes that multitasking and constant partial attention, which are observed in the vast majority of Internet users, have long-term negative effects on productivity, creativity, and cognitive abilities. The researcher emphasizes that the quick-to-digest and simple nature of online information often discourages people from making the effort to find better content and does not encourage deeper immersion in a topic, offering instead ready-made, simpler answers.

Connectivity and Communication: Digital communication tools facilitate global and interpersonal connections, reducing loneliness and enhancing social support. Among the positive aspects, researchers identify the ability to maintain relationships with friends and family regardless of geographic location, which helps to reduce negative impacts on mental health during the separation. Yet, excessive use of technology for communication contributes to smartphone addiction, social media-related stress, and cognitive overload, leading to negative mental health outcomes. Psychologist Amy Cuddy notes among the negative consequences ADHD, which is increasingly observed in children, as well as a significant rejuvenation of mental disorders such as depression, anxiety, and eating disorders [6, p. 162].

Threat to Human Employment: The rise of AI poses a threat to human employment, potentially displacing workers and exacerbating economic inequality. Psychologist Carol Dweck expresses concern about the increasing automation of work that was traditionally done by humans [3, p. 41]. This could potentially cause job displacement and increase economic inequality in the world, which could lead to a psychological crisis, especially among representatives of creative professions such as designers, digital artists, and copywriters, whose work is already successfully performed by artificial intelligence. With the further development of AI technologies, such professions and industries may become outdated, leading to unemployment or underemployment of people whose skills are no longer in demand.

Conclusion: Modern technologies are present in almost all aspects of human life and have a significant impact on the psyche. They shape mental health, provide contact with society, influence social behavior and well-being. While technologies provide numerous benefits to users, their widespread presence also creates risks to psychological health and social interaction. Psychological studies are highly relevant to understanding the ecological interactions between the human psyche and technology. Solving these problems will remain relevant as technologies continue to develop and become increasingly integrated into human life.

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STRUCTURAL-SEMANTIC FEATURES OF PHRASES WITH THE COMPONENT “WATER”

Water is an important element of life since it plays a leading role in a human life; we are all made up of 70% water. Therefore, it is interesting to explore how exactly water functions in the English language on the example of phrases.

The topic of water is always relevant as existence without it is impossible. Moreover, phrases are an important part of language that help to form more accurate and effective communication.

The aim of the work is to reveal the structural-semantic features of English phrases with the component “water” based on the English lexicographic sources.

It should be mentioned that five lexicographic sources have been used to single out phrases with the component “water”: Longman Dictionary [4], Oxford Learner’s Dictionary [7], Cambridge Dictionary [1], Collins Dictionary [2] and Merriam Webster Dictionary [5].

In modern linguistic research scholars pay increasing attention to studying phrases. Linguists note that phrase is a group of words that function as components

of simple sentences [8, p. 110]. Researcher Mark Newton, in his collection of works titled “Basic English Syntax with Exercises” [6, p. 60], defines word combinations as groups of words that form a single part of speech, serving as equivalents to proper names within a sentence.

Ukrainian scientist Svitlana Shevchuk [9, p. 519], based on structural models, proposes dividing word combinations into the following categories:

1. Single-component phrases. They are represented by a single word, for example: ***water, watering, ground.***
2. Two-component phrases. Among these, the following models are most common: *N + N (coffee table, ice cream); Adj + N (red apple, small dog).*
3. Three-component phrases: *Adj + Adj + N (black silk dress, bright blue skirt); Adj + N + N (tasty ice cream, sandy sea); N + N + N (dog food bowl, apple tree branch).*
4. Multi-component phrases. These phrases contain four or more components: ***large wooden table in the dining room, blue steel trash can in the kitchen.***

It must be noted that 183 phrases and 8 idioms have been found in the lexicographic sources selected for the study:

- 18 phrases containing the component “water” have been singled out from the Longman English Dictionary: *high/low water, make/pass water, soda water, toilet water, drinking water, tap water, bottled water, mineral water, spring water, running water, fresh water, salt water, hard water, soft water, lukewarm water, dirty water, contaminated water, soapy water* [4].

- 14 phrases with the component “water” were proposed in the Oxford Dictionary: *bath water, holy water, iced water, lime water, rose water, salt water, sea water, soda water, fizzy water, deep water, low water, high water, standing water, territorial waters* [7].

- there were 65 phrases in the Cambridge Dictionary: *tonic water, water bird, water fountain, water main, water polo, water supply, white water, water boy, water ice, gray water, heavy water, light water, waste water, water bath, water bear, water bill, water butt, water clock, water cycle, water jump, water kite, water lily, water mill, water park, water power, water rates, water slide, water table, water tank, water tower, water vapor, water wings, branch water, casual water, ground water, micellar water, quinine water, surface water, water ballet, water biscuit, water buffalo, water cannon, water chestnut, water closet, water column, water cooler,*

water feature, water filter, water flosser, water hyacinth, water meadow, water pistol, water scorpion, water softener, water sports, distilled water, water absorption, water repellent, water retention, high water mark, low water mark, water bag, water ski, ditch water, water heater [1].

- As for the Collins Dictionary, 16 phrases were found in it: *watering, water down, water transport, water plants, lithia water, ammonia water, to drink water, noisy waters, still waters, above water, under water, water birds, a water wheel, water blister, water jug, water turbine [2].*

- 70 phrases were found in the Merriam Webster Dictionary: *coconut water, tread water, water bed, water bloom, water blister, water dog, water closet, water butt, water gun, water hole, water plantain, water pill, water pipe, water supply, water trail, water vascular system, white water, hot water, first water, giant water bug, cold water, fresh water, heavy water, hot water bottle, water balloon, open water, water beetle, water buffalo, slack water, water column, water boatman, water hammer, water level, water cannon, water snake, water balance, red water, water shield, water sapphire, salt water taffy, water garden, water pressure, water mold, water parting, water pepper, water nymph, water moccasin, water glass, water turkey, water gate, water sprite, water witch, water cremation, water gap, water gas, water hemlock, water milfoil, water jacket, water ouzel, water oak, water hen, water wagon, water strider, water meter, water rat, water privilege, water right, water haul, water gauge, water taxi[5].*

In addition to phrases, 8 idioms were also commonly found in all the dictionaries mentioned above: *be in hot water* – to be or get into trouble; *blow somebody out of the water*– to show that somebody is not good by being very much better than them; *clear blue water* – a complete difference between two people; *dip a toe into the water*– to start doing something very carefully; a *fish out of water*– a person who feels uncomfortable; *like a duck to water* – very easily, without any problems or fears; *still waters run deep*– a person who seems to be quiet or shy may surprise you by knowing a lot or having deep feelings; *water off a duck's back* – used to say criticism has no effect on somebody.

All the found phrases were divided into models (formulas), having analyzed them by structure. In the course of the work, the following models were identified:

1. N + N: *soda water, toilet water, tap water, spring water, salt water, bath water, lime water, rose water, salt water, sea water, soda water, water bird,*

water fountain, water main, water polo, water supply, white water, water boy, water ice, water bath, water bear, water bill, water butt, water clock, water cycle, water jump, water kite, water lily, water mill, water park, water power, water rates, water slide, water table, water tank, water tower, water vapor, water wings, branch water, ground water, micellar water, quinine water, surface water, water ballet, water biscuit, water buffalo, water cannon, water chestnut, water closet, water column, water cooler, water feature, water filter, water flosser, water hyacinth, water meadow, water pistol, water scorpion, water softener, water sports, water absorption, water-repellent, water retention, water bag, water ski, ditch water, water heater, water transport, water plants, lithia water, ammonia water, water birds, a water wheel, water jug, water turbine, coconut water, water bed, water bloom, water blister, water dog, water closet, water butt, water gun, water hole, water pistol, water plantain, water pill, water pipe, water supply, water trail, spring water, water balloon, water beetle, water buffalo, water column, water boatman, water hammer, water level, water cannon, water snake, water shield, water sapphire, water garden, water pressure, water mold, water parting, water pepper, water nymph, water moccasin, water glass, water turkey, water gate, water sprite, water witch, water cremation, water gap, water gas, water hemlock, water milfoil, water jacket, water ouzel, water oak, water hen, water wagon, water strider, water meter, water rat, water privilege, water right, water haul, water gauge, water taxi.

2. Adj+N: *high/low water, drinking water, bottled water, mineral water, running water, fresh water, hard water, soft water, lukewarm water, dirty water, contaminated water, soapy water, holy water, iced water, fizzy water, deep water, low water, high water, standing water, territorial waters, tonic water, gray water, heavy water, light water, casual water, distilled water, noisy waters, still waters, white water, hot water, first water, cold water, fresh water, heavy water, open water, slack water, red water.*
3. Adj + N + N: *high water mark, low water mark, hot water bottle, giant water bug.*
4. N+Adj+N: *water vascular system.*
5. N + N + N: *salt water taffy.*
6. N+-ing: *watering.*
7. V + N: *make/pass water, waste water, drink water, tread water.*
8. Prep. + N: *above water, under water, water down.*

From which it can be seen that the most popular is the *N + N model*, less popular but still widely used is the *Adj + N model*, other phrase models are not widely used.

As for the semantic features of the selected phrases with the component “water”, they can be divided into certain groups by meaning, namely the following can be highlighted:

1. Types of water by purpose and use: *drinking water, tap water, bottled water, salt water, fizzy water.*
2. Its physical states and properties: *running water, still waters, hot water, cold water.*
3. Its characteristics: *dirty water, contaminated water, soft water, hard water.*
4. Measurements of water: *high water, low water, high water mark, low water mark.*

Idioms represent:

1. manner of behavior and character of a person: *blow somebody out of the water, dip a toe into the water, a fish out of water, still waters run deep, water off a duck's back.*
2. a difficult situation: *be in hot water.*

To sum up, in the course of the work to identify phrases with the component “water”, 5 dictionaries were involved, namely, Longman Dictionary, Oxford Learner's Dictionary, Cambridge Dictionary, Collins Dictionary, and Merriam Webster Dictionary. All the singled out phrases were divided into models (formulas), having analyzed them by structure, which shows that the most popular is the *N + N model*, less popular but still widely used is the *Adj + N model*, other phrase models are not widely used. As a result of the research, we can understand the nature of phrases, their structure, and usage in English more deeply. This provides an opportunity to better understand speech practices and the interaction of words in speech, which is important for further research in linguistics and philology.

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ARTIFICIAL INTELLIGENCE AS A POTENTIAL DEVIATION FACTOR DUE TO ITS WIDESPREAD APPLICATION

In modern conditions, the factor of the latest technologies and related phenomena is potentially a rather significant element of the subject's perception of the state of human existence and an element of the social spectrum (in a dynamically changing, technologically loaded environment). In this context, the field (and more broadly, the direction) of human information and technological environment emerges as quite significant, especially in terms of constant interaction.

However, the phenomenon of the problem of intelligence and its representation within the technical spectrum (as one of the elements, or more broadly, tools in the context of human existence) is currently considered a rather contemporary issue. The phenomenon of the problem is quite complex, but in this context, the element of delineating the phenomenon of intelligence and its relationship with tools within the technical spectrum, collectively referred to as "artificial intelligence," is of greater interest.

Artificial intelligence emerges as a significant element in the contemporary social environment, as it represents a substantial and potentially beneficial aspect of incorporating instrumental character into the context of human existence. It also entails a tendency to increase its role. In such a context, the issue of the functioning of the relationship between deviation and the problematics of artificial intelligence arises.

Possible changes in the nature of formation and some features of manifestation and the potential significance, which is currently seen as growing, of deviance as a socio-psychological phenomenon and artificial intelligence as an interface software and hardware complex that is increasingly integrated into the life of the individual. This can be defined by different circles of the social environment as such.

However, as this instrumental mechanism improves life in some aspects, its potential has not yet been fully realised, and in the near future it may give rise to new features that are difficult to predict. However, it is difficult to isolate the problem of detecting deviations with the correlation of features formed by the technological trend and the development of artificial intelligence, since one of the main reasons is the element of active formation of this phenomenon, i.e. this element is formed as an element built into most areas of life and the correlation of its impact on humans is just beginning to manifest itself, which can be identified in an evidential scientific sense in the future, within the framework of interdisciplinary research, by a number of sciences, primarily of a socio-behavioural orientation.

The subsequent question arises: How much can artificial intelligence impact the tangible expression of an individual's behavior and the display of their personal and individual traits within the context of deviation formation in both individual and group settings? Here, the following factor is outlined that is related to the formation of the phenomenon of artificial intelligence, since the element does not emerge as a complete and fully ready instrument of instrumental meaning for a person, but it is only beginning its way of implementation in human life.

It is quite difficult to outline the problematic of the deviation phenomenon through the prism of artificial intelligence alone, since deviation has a multifactorial source and a mixed genesis of formation and development, so it is difficult to single out the leading role and the phenomenon of the element of deviation formation through the prism of artificial intelligence alone.

Since the massive spread of artificial intelligence is gradual, and mechanisms for its processing and formation are being developed, it can be noted in this context that it is premature to identify the relationship between these factors. However, artificial intelligence, due to its gradual integration into the labour and social environment, can potentially lead to its establishment and prevalence as an element of the social spectrum, which can become one of the factors in the context of external influence and the formation of deviance as such.

Such synergy in the interaction between social (changes in many areas of social life), technological (non-networked software systems with generative capabilities, such as generative artificial intelligence with a natural verbal interaction interface), and the values of modern society (transhumanism, gender neutrality,

technocracy, emancipation, inclusiveness, etc.) can give rise to both new forms of deviance and, potentially, alter the manifestations of existing forms of deviance.

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AI RESOURCES FOR TEACHING, STUDY AND RESEARCH

Artificial Intelligence (AI) has emerged as an indispensable ally within the dynamic landscape of education and research, reshaping the way knowledge is acquired and investigations are conducted. The proliferation of AI tools tailored to diverse needs has ushered in a revolutionary era in the academic sphere, offering a comprehensive range of capabilities, including writing assistance, citation generation, grammar checking, paraphrasing, and presentation creation.

1. Wordtune [7], a potent AI tool, plays an important role in refining language expression, suggesting alternative vocabulary, and ensuring content clarity and engagement. It serves as an adaptive writing companion, tailoring each piece of content to the unique style of the user. The free plan has the daily limit of requests.

2. Grammarly [3], a widely embraced grammar checker, transcends conventional grammar-checking tools. Employing advanced algorithms, it analyzes writing styles

and provides nuanced suggestions for improvement, encompassing vocabulary enhancement and tone adjustments.

3. The WebChatGpt [5] extension serves as a valuable tool for crafting article outlines and seamlessly paraphrasing texts, augmenting productivity and creativity. It contributes to well-structured and engaging articles, thereby saving valuable time and effort.

5. Litcharts [1] simplifies the arduous process of generating MLA citations, enabling researchers and students to prioritize content creation over formatting. The tool automates MLA citation generation, ensuring not only the depth of insights but also impeccable formatting precision.

6. Twee [4] saves time spent by teachers for composing tasks covering reading, writing, vocabulary, listening, speaking, and grammar. The platform provides AI-generated tasks for the above skills as well as Youtube or Vimeo videos transcripts (5 minutes limit in the free plan).

7. Wepik AI [6], an intelligent presentation maker, streamlines the presentation creation process by offering ready-made outlines. It ensures visually appealing presentations, leaving a lasting impression on the audience.

8. Gamma [2] emerges as an AI presentation maker with considerable potential. While acknowledging the need for refinements, it stands as a promising tool for those exploring innovative horizons in presentation creation.

Gamma also proposes the beta-version of an AI-powered website creator. Given the site title it creates an outline and content for your site.

The sites mentioned above serve as powerful platforms for knowledge dissemination, collaboration, and data sharing, enhancing efficiency and fostering a collaborative academic environment. The integration of AI resources in websites not only automates repetitive tasks but also allows scholars to focus on critical analysis and innovation, enriching the overall academic experience.

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SOCIAL ADAPTATION OF UKRAINIAN YOUTH ABROAD: OPPORTUNITIES AND LIMITATIONS

Migration is a complex phenomenon that involves individuals or groups relocating from one place to another, often in search of better opportunities or to escape unfavourable conditions. Among those who migrate are young Ukrainians, who face various challenges and opportunities when adapting to life abroad. Understanding the process of adaptation among Ukrainian youth in foreign countries is crucial for addressing their needs and facilitating their integration into new cultural environments.

One of the main aspects of migration is adaptation to a new socio-cultural environment. Young Ukrainians who migrate abroad face various challenges and stages of adaptation, which are complex and require time and effort. A comprehensive analysis of interpersonal, social, ethnic, and cultural barriers and tensions requires social scientists to better understand the dynamics, challenges, and outcomes of sociocultural interactions and practices. Consequently, researchers from a variety of disciplines, including sociology, have been studying the sociocultural interactions between migrants and host communities. To support the data for this term paper, a sociological study was conducted on the dynamics of the stages and phases of cultural adaptation of Ukrainian migrants when entering the host society. To analyze better these complexities, the study used the research method of semi-structured interviews to collect data. The participant selection process was focused on young Ukrainians aged from 18 to 26 living abroad, and the data collected was analysed using a close description.

Thus, the process of adaptation abroad can be difficult for young Ukrainians, but at the same time it can be an important experience for personal development and international mobility. It allows young people to broaden their horizons, develop intercultural competence, acquire new knowledge, skills, and experience in a different cultural environment. The research provided information about the experience of

social adaptation of Ukrainian youth living abroad and identified key opportunities and constraints faced by young Ukrainians in a foreign environment. This understanding will contribute to the development of support systems and policies that will facilitate smoother social and cultural adaptation of migrant youth.

The first stage includes the initial understanding and expectations of immigrants about their future culture, values, and neighborhood with the host country, planning for passive social integration, i.e. they can count on the support of a wide range of people and active social integration, which includes opportunities to realise the culture, values, and environment of the host country. In particular, these are opportunities for self-realisation in certain areas of life after displacement. This stage is characterised by a cognitive comparison between the area of residence and the environment. The second stage of adaptation of Ukrainian youth abroad is the stage of emotional changes. Leaving a familiar environment, family, friends, and mother tongue can be difficult for young Ukrainians. They may experience doubts and anxiety, especially in the first months of their stay in a new country. Culture shock can also affect the emotional state of young Ukrainians. There are significant differences in mentality, customs, and values that can cause anxiety and confusion. In the third stage, when the level of integration increases, migrants – sometimes by choice, sometimes by force – become members of social groups and perform certain social roles. At first, new roles and difficulties of everyday life can be frustrating for migrants. However, as soon as immigrants begin to overcome the difficulties inherent in their socio-cultural situation, they gain self-respect and self-confidence. It should be noted that during the enhanced integration phase, migrants' reactions vary greatly, depending on their personal characteristics and accumulated social capital. The fourth stage of adaptation is the stage of socio-cultural adjustment. Young Ukrainians may face difficulties in communicating with the local population due to language and cultural differences. Learning the language of the new country and familiarizing themselves with local customs, rules of behavior, religion, and traditions are important aspects of socio-cultural adaptation. Young Ukrainians may also seek to live together with other Ukrainians and people from other countries. This can provide them with support, shared experiences, and the opportunity to understand each other. The fifth stage of adaptation is socio-economic adaptation. Young Ukrainians who move abroad may face economic challenges, such as finding a job, obtaining educational and professional qualifications, and finding a place in

the labor market. They may also face discrimination and difficulties in everyday life, such as obtaining appropriate documents, renting housing, and accessing healthcare. However, with hard work and determination, young Ukrainians can overcome these difficulties and thrive in their new country. The final stage of adaptation is integration into the new culture and society. Ukrainian youth gradually enter a new social and cultural environment, take an active part in local life, and learn local values and codes of behavior. Having passed all the previous stages of adaptation, Ukrainian youth can interact more deeply with the local community, and understand local values, rules of behaviour, and social structures. They can speak the language of the country they live in and understand local cultural differences. Integration can also include participation in local social, cultural, and sporting events, expanding social networks, and getting to know the local community [1].

The process of adaptation abroad can be challenging for young Ukrainians, but at the same time, it can be an important experience for personal development and international mobility. It allows young people to broaden their horizons, develop intercultural competence, and gain new knowledge, skills, and experience in a different cultural environment. The study showed that the younger the age of Ukrainians at the time of moving, the easier the adaptation process was for them and the faster it went. The process of adaptation is always a challenge for a person who finds himself/herself in a new environment. Ukrainian youth face numerous problems in the process of their adaptation abroad. These problems can be broadly divided into cultural, social, psychological, and economic aspects, which often intertwine and increase the difficulties of the adaptation process.

Among the cultural challenges, there are two main subtypes: language barriers and culture shock. Language is one of the most serious problems faced by young Ukrainians abroad. Adapting to a new language can be a slow and unpleasant process, making it difficult to communicate effectively and establish social ties in a new environment. Culture shock is also a common phenomenon faced by people who move to another country with a significantly different cultural background. It can be difficult for young Ukrainians to adapt to the “local” social norms, values, customs, in short, the everyday socio-cultural infrastructure, which in turn can cause feelings of isolation and alienation. The informant Oleksandr (20 years old, Berlin) draws attention to this aspect of the “socio-cultural interface” mismatch, namely, the problem of understanding some aspects of German humor and some difficulties

in communication in this regard. At the same time, adapting to different cultural norms and expectations can be challenging and may lead to misunderstandings or conflicts [2].

In terms of social challenges, discrimination and stereotyping are significant barriers to adaptation for young Ukrainians abroad. They may face prejudice or negative attitudes from the local population due to their nationality, ethnicity, or migrant status. This can manifest in various forms, such as exclusion from social groups, unfair treatment in the workplace, or even verbal or physical harassment. Discrimination and stereotyping can have a profound impact on the mental well-being of young Ukrainians, leading to feelings of alienation, frustration, and injustice.

Moreover, the lack of social support networks can exacerbate the challenges of adaptation. Without friends, family, or other forms of support in the host country, young Ukrainians may feel isolated and lonely. They may struggle to navigate the complexities of their new environment or cope with homesickness and nostalgia for their homeland. Social isolation can contribute to mental health issues such as depression and anxiety, further hindering the adaptation process [3].

Financial difficulties also pose a significant obstacle to the adaptation of young Ukrainians abroad. Limited access to employment opportunities, coupled with language barriers and difficulties in obtaining recognition for their educational qualifications and professional experience, can leave them economically vulnerable. High competition for jobs, especially during economic downturns, can exacerbate these challenges, leading to unemployment or underemployment among young Ukrainians. Financial instability can further compound feelings of stress and uncertainty, making it difficult for them to establish a stable and fulfilling life in the host country [4]. Despite these challenges, young Ukrainians demonstrate remarkable resilience and adaptability in navigating the complexities of life abroad. They employ various strategies and forms of adaptation to overcome obstacles and thrive in their new environments. These adaptation strategies include:

- Searching for self-affirmation. Young Ukrainians seek opportunities for self-fulfillment through continuous job search and exploration of different activities. By embracing change and pursuing diverse interests, they enhance their adaptability and self-esteem, ultimately fostering personal growth and resilience.\
- Self-affirmation through education. Many young Ukrainians pursue higher education or vocational training in the host country as a pathway to socio-

economic advancement. By acquiring new knowledge and skills, they increase their employability and competitiveness in the labor market, while also fostering critical thinking and problem-solving abilities.

- Adaptation through the accumulation of cultural capital. Learning the language, customs, and traditions of the host society enables young Ukrainians to better navigate their new environment and establish meaningful connections. Acquiring cultural capital reduces the likelihood of social isolation and promotes a sense of belonging and inclusion in the host community.

- Adaptation through the creation of social capital. Establishing new social ties, participating in community activities, and building support networks facilitate the integration of young Ukrainians into the host society. By fostering intercultural understanding and mutual support, social capital enhances their well-being and contributes to the development of a more cohesive and inclusive community.

In conclusion, the process of adaptation among young Ukrainians abroad is multifaceted and dynamic, characterised by various challenges and opportunities. Despite facing obstacles such as language barriers, discrimination, and financial difficulties, young Ukrainians demonstrate resilience and adaptability in navigating their new environments. By employing diverse adaptation strategies and leveraging personal strengths, they not only overcome barriers to integration but also contribute to the cultural diversity and social cohesion of their host countries. Understanding the complexities of adaptation among young Ukrainians is essential for developing effective support systems and policies that promote their successful integration and well-being in diverse cultural contexts.

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TOPICAL ISSUES IN NATURAL LANGUAGE PROCESSING

The purpose of this paper is to provide a brief review of current issues related to Natural Language Processing. In the digital era NLP technologies occupy a unique niche, trying to bridge the gap between human language and machine understanding [2, 3]. At first glance, it may seem that machines understand human speech very easily, but behind this picture lies a carefully selected combination of algorithms, data and computation that is not without errors.

In-depth explorations of NLP reveal many barriers and challenges that prevent seamless machine-to-human communication. This constant flux requires NLP systems to regularly adapt to ensure their relevance and effectiveness in real-time scenarios. In general, there are 7 main challenges in modelling and designing NLP models.

1. Idiomatic and figurative language, polysemy. In addition to the literal interpretation, languages contain phrases whose meaning does not follow directly from the words that make them up. To understand the essence of idioms, metaphors or similes, an NLP system has to go beyond parsing and dive into the semantics of the information. In other cases, the used words may have different meanings depending on the context, adding to the complexity of building an NLP model.

2. Lack of annotated data. Although the digital age offers an abundance of textual data, the lack of annotated datasets, especially for dialects or regional languages, limits the universal applicability of many NLP solutions.

3. Ethical standards. Biased (or discriminatory) training data can cause NLP systems to produce skewed results, inadvertently perpetuating social, gender, or other views. This requires rigorous objectivity checks and methods to eliminate data bias.

4. Security and Reliability. As NLP models improve, they become vulnerable to manipulation and hostile attacks. Ensuring their resilience to intentional false inputs is a primary task to achieve reliable results [1].

5. Computing costs. High-performance NLP tasks require significant computing power, which raises questions about model scalability and the environmental impact of these models, given the resources required to keep the system running.

6. Interpretability of the model. The "black box" nature of many NLP models hinders model transparency, making it difficult to identify the causes of

certain model results [1]. Healthcare, medicine, and law are among the fields where this problem needs detailed study and solution [2].

7. Multimodal integration. The synthesis of textual data with visual or auditory signals is a new and rapidly developing area of NLP. Creating systems that consistently process and generate content in different modalities remains a topic issue for developers.

Although NLP technologies continue to cross boundaries and evolve, it is important to address these issues for their holistic evolution and realization of their full potential in various applications. Further research should more thoroughly investigate the abovementioned issues.

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THE ISSUE OF TECHNOLOGY AS A WAY OF TRANSCENDING FREEDOM IN THE LATE M. HEIDEGGER'S PHILOSOPHY

The problem of technology belongs to the late period of M. Heidegger's work. It raises the question of the human thinking possibility – how is it carried out in the post-industrial era? Technique is considered both as the essence of thinking and as its burden. In our study we interpret technology as a phenomenon of technical progress of the 20th century. In analysis of the state of the epoch, M. Heidegger points up the issues connected with the readiness of human thinking **inparticular**: to understand the essence of things; to know what they are made of and for what purpose; to appreciate how to deal with them. Moreover, it is important to emphasize that the technology that is included in the education of a person and which is itself a human, even ancient, way of being educated and interacting with the world.

M. Heidegger gives the basic statement of the problem of technology in "The Question Concerning Technology". He discusses how to prepare the possibility of a free attitude towards it. Presence in M. Heidegger's philosophy is Dasein, or here-being. This human way of being is profoundly existential and in this case means that we, humans, have to make ourselves aware of what is essential in relation to technology itself in order to be able to talk about the essence of technology and its impact on the world. It is necessary to experience historical events together with it, so that the technique shows itself through social, political, religious disturbances and its participation in the behavior and reflection of people. It shows that the technique is in immediate reality with us, in here-being.

M. Heidegger believes that the essence of technology will not be identical to the actual technology that is expressed by inventions and devices. He emphasizes that such an identification is ominously correct, as it leads to the power of the human spirit over technology [2]. This power will be represented in the technology usage in the same way that it has already once subjected half the world to the decision of the other half of the world. Obviously, the experience of nuclear weapons is meant. In a philosophical sense, the essence of technology is expressed in the sphere that is opened by actual technical means, as the sphere in which the essence of truth is realized. In M. Heidegger's philosophy, the realization of the truth essence has the features of man and freedom. Therefore, the use of technology can show the humanity of people as well as the truth of human existence and express freedom limitations. M. Heidegger works out that the nature of the planet Earth is placed in an unheard of demand to be a supplier of energy [2]. This moment brings us back to the philosophical aspect: when in relation to the surrounding world, we perceive it as a provider, and surrounding people as consumers. Therefore, people, the world and awareness are related through the production and the support of technical means (from telephones and computers to nuclear weapons and space rockets).

M. Heidegger states that modern technology, which deals with the production, distribution and presentation of things (their type, quantity, quality, context, essence) does not concern only a human. Moreover, in the fast pace of life, we do not have time to analyze the fact that the surrounding things can also influence us, obey us or require certain compliance with norms (for example, social status, material security, regional features of residence, political views). That's why M. Heidegger explains this phenomenon of possession through the phenomenon of Gestell, which is usually

translated as "posture", or resolution, instruction. M. Heidegger writes about the Gestell as that which unites everything technical in the height of the first significance. At the same time, Gestell itself is not actually technical, has no empirical embodiment and acts as a compulsion of man-made culture [2]. In a philosophical sense, it means to deviate from the instruction or to go beyond what is a purely technical setting of things, that's to be available for disposal. In other words, human thinking begins with things that are fully and completely what they are made to possess. M. Heidegger outlines that man is placed and used by a force that has a technical manifestation, but which cannot be found in a technical object. At the same time, M. Heidegger cites classical ideals as antonyms of the metaphysics of technology: the Christian God, beauty, good, eternal. M. Heidegger considers his own ideals of technology to be still hidden, but they will appear most likely, in atomic technology, electrical engineering, and machine engines [2]. So, M. Heidegger's technique belongs to the deceptive appearance, or to the section of knowledge of appearance.

M. Heidegger states that technology in the future will contribute to the realization of truth, freedom and man. In his opinion, it is impossible to own technology [2]. Technology goes into transcendence, showing how a person overcomes himself, changes some concepts, norms of that **humanexistence** sphere in which certain issues were solved technically. For example, the norms of waging war after the use of nuclear weapons, or the concept of war after signing a memorandum on the prohibition of declaring war (a country that declares war will commit a war crime that has no statute of limitations). M. Heidegger is convinced that people try to bypass, already established norms with the help of technology (for example, not to declare war, but to conduct military operations under any other name), this is unacceptable means and the use of technology which is essentially non-technical. Gestell means establishing human will in the surroundings of things that convey truth. And Gestell refers to the nihilistic foundations of the relationship between people, which are expressed in an anti-human way (first of all, the conformity of human behavior to the environment of things is put). It is worth noting that there is another successful translation of this concept – framing, giving appearance and visibility the presence of truth primarily by appearance.

M. Heidegger calls Gestell, which is already part of human thinking, a way of sending a person into the world [2]. That is, Gestell, in a certain sense, replaces the supreme idea of God: not divine, but technical providence is the beginning of meaningful human existence. M. Heidegger believes that people have already made

such a historical message to the world since the 20th century. At the same time, as M. Heidegger notes, technology does not depend itself, does not impose fatalism, powerlessness and the end of history compared to how the church defends God. In the case of the Christian God, this is his personal message. In the case of the phenomenon of technology, it is a personal decision of people: to immerse themselves in a degenerative improvement with liberating responsibility [2]. This responsibility is expressed by transcending through the things to which one belongs. The dependence of a person is that the appearance of things (their empirical embodiment and the context of consumption) is enough for him – her to perceive the truth. **The truth**, is always within us and accessible through what is in our hands. And since it is impossible to master technology, the integrity of man, freedom and truth is violated due to the fact that human thinking is not yet ready to express the essence of technology. M. Heidegger believes that this problem is so fundamental and urgent that it is too early to talk about its solution. Twenty years after the publication of "The Question Concerning Technology", M. Heidegger answered questions about it in an interview with the "Spiegel" newspaper, in such a way that only God can save people [1].

So, the phenomenon of technology is represented in the type of thinking called Gestell in the post-war period, in the 1950s. The specificity of this phenomenon is based on the consumer attitude to things, as well as the belief that tools, inventions and products will preserve well-being and bring peace to the world.

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DIFFICULTIES OF THE MEDICAL TERMS TRANSLATION

The problem of medical translation – that is, certain difficulties and inconveniences associated with the translation process – has always existed, but in the last decade it has become especially relevant, as evidenced by numerous articles on this topic that have appeared both in periodicals and on the World Wide Web [1].

There are several main areas of medical translation: medical documentation (medical history, results of laboratory and instrumental examinations, protocols of operations, expert opinions); documentation on clinical trials of drugs (agreement on clinical trials, study protocol, study brochure, form of informed consent, individual registration card); pharmaceutical documentation (annotation of drugs, leaflets, information for doctors and patients, documentation on quality control); documentation for medical equipment and tools (operating instructions, manuals, descriptions, advertising materials, catalogs, presentations); sites on medicine, pharmacy, clinical trials, medical equipment and tools; popular science literature on medicine; scientific medical literature (scientific articles, conference proceedings, reviews, abstracts, dissertations, monographs, reference books, manuals, textbooks for doctors and medical students.

The difficulty of analysis lies in the fact that the term is a conservative phenomenon [2]. It is quite difficult to identify something new and unusual. In addition, terms often do not consist of a single word, but are a combination of words, each of which has its own transformation during translation.

Medical texts are characterized by a peculiar construction of sentences. Often the structure of the English expression from medical area is replete with complex grammatical constructions (infinitive and gerund), which complicates the definition of logical emphasis in the sentence. All this leads to ambiguity in the translation of the text.

When translating the names of organizations and their abbreviations, we should first translate the full name of the organization, and then shorten it to the abbreviation. The translator should be careful, because the equivalent of the abbreviation may already exist in the language of translation: *The National Health and Nutrition Examination Survey (NHANES)* – *Національна програма перевірки здоров'я та харчування (НППЗХ)*, *The National Center for Health Statistics (NCHS)* – *Національний центр медичної статистики (НЦМС)*.

Quantitative analysis showed that transliteration is the most frequent transformation for medical terms. Indeed, the overwhelming majority of terms are the names of diseases and other internal processes of the body, borrowed from the Latin language, they are international, therefore they are often transferred from one language to another through transliteration: *lymphadenopathy* – *лімфаденопатія*; *myocarditis* – *міокардит*, *hypertrophic cardiomyopathy* – *гіпертрофічна кардіоміопатія*; *cytolysis* – *цитоліз*. Into the second place in terms of frequency can be put loan

translation: *mobilized metals* – мобілізовані метали; *photophobia* – світлобоязнь; *intravenously* – внутрішньовенно; *rubella* – краснуха.

In conclusion, we have found that transliteration is the most common translation technique for medical terms because of a large number of Latin names in medical science. On the second place is loan translation. As for grammatical transformations of medical terms, the most characteristic is the transposition of words during translation and grammatical replacement (most often parts of speech are changed along with the syntactic transposition).

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FREE “FOR NOTHING” OR THE FATE OF WOMANHOOD ON THE PAGES OF SIMONE DE BEAUVOIR’S “THE SECOND SEX”

The main problem of society throughout history remains the habit of dividing the whole and opposing its parts to each other. The concept of ‘human’ fades against the backdrop of heated debates about which gender is more privileged or powerful. The lack of unity provokes the need for one element to dominate over another. The question of why women specifically allowed themselves to be conquered and reconciled with their inferiority remains relevant. Simone de Beauvoir noted that “the division into sexes is actually nothing but a biological factor, not a phenomenon in the history of humanity. Their irreconcilable antagonism arose in the depths of primitive human society and was not eradicated” [1, p. 31]. The brute physical strength of man was seen as a means of conquest and power retention, while a woman's body was deemed insufficiently resilient and suitable only for motherhood. Then, it became a matter of time. Women were so often persuaded of their tenderness and vulnerability from birth that it became true for many of them.

One of the most relevant obstacles on a woman's path to freedom has always been the lack of unity with other members of her gender. Indeed, stating that you vehemently condemn the fact of comprehensive male dominance while being closely associated with men (father, brother, fiancé, lover, etc.) is sometimes perceived as hypocrisy. But this is only because the presence of a man in a woman's life is imagined as a gift or something to be proud of. Some women feel guilty about daring to speak out about any male shortcomings or injustices perpetuated by patriarchal society. Especially those who attribute their success or well-being to a man.

It turns out that 'happy women' convince themselves that they have enough rights and freedoms and do not see the need to join the struggle for the happiness of other women. "Refusing to be different, to stop pleasing men – for them, this meant giving up many benefits that the alliance with the higher caste gives them", as the author herself described it [1, p. 32]. This is what hinders the establishment of female solidarity – a sense of duty towards the man with whom they have "been lucky", fear of being abandoned and deprived of his affection. Of course, such circumstances were also influenced by the historical development of relations between the sexes.

As we know, the pen with which history was written has long been in the hands of men. Women could only play the role of muses, but certainly not as writers. Simone de Beauvoir noted that "...in a world where men practically remained the sole masters, women possessed 'empty freedom'." They were free "for nothing" [1, p. 95].

Once the female body was equated with her overall essence, the body itself became both a means of self-affirmation and the fiercest adversary for a woman. It became a societal property. In this, like the author, I see a clear parallel with Nature, which has also always been sought to be subdued and exploited. "Woman is filled with the same dark forces, the incomprehensible power, as the earth" or "From her labor and miraculous abilities depended the children, livestock, harvest, provisions – the entirety of the community's well-being, of which she was the soul [1, p. 77–78]. Such power instilled in men both reverence tinged with fear, reflected in the customs of the time. To them, woman was the embodiment of all the alienation of Nature" [1, p. 79]. Currently, criticisms about women never achieving anything on their own and not making grand discoveries are very popular. According to Christine de Pizan, Poullain de la Barre, Condorcet, Stuart Mill, Stendhal, women never had a chance of success in any field. And the explanation for this is quite simple. The path society

paved for women over centuries did not include mandatory education for them, only marriage, motherhood, and complete dependence on men.

These trends are still relevant today, and this is the main reason why women do not stop their struggle for freedom. To carve out her own freedom, a woman must battle not only against the world but also against herself. Those who succeed in this are no longer seen as women; they are deemed successful, yet society perceives them as a threat. By challenging the male-dominated world, a woman must stop playing by its rules. For they are all written to ensure victory for men. The path to freedom does not lie in accepting that you are a woman, but in believing in it. Only then can we hope that the concept of “femininity,” ultimately, will signify not weakness but rather dignity, fierceness, defiance, and self-respect.

The path to independence for a woman is rugged because she doesn't yet know where she's going. The concept of “independence” is highly controversial when it comes to women. They want to be equal to men but at the same time not give up themselves, what they have already embraced. A woman feels a significant duality and discomfort, demanding freedom but not willing to abandon her current position. This is because society has long associated femininity with passivity, groundedness, and submissiveness. A woman is ashamed to be a woman because her behavior and preferences are all stereotypes.

While even a hint of dominance persists in relationships between men and women, the issue of gender equality and female independence will remain a battlefield for conquerors and the conquered. Women rebel because their entire lives are filled with coercion, duties, and limitations. By providing women the opportunity to take the same position where men have confidently settled down, liberating them from constraints and judgment, helping them adapt and showcase their potential, society not only loses nothing but also gains significantly more – potential, fresh perspectives, and finally – the long-awaited truce. It's worth demolishing the notion that in order for a woman to be respected and considered authoritative, she must be feared. Fear of someone is always a concealed manifestation of hostility and distrust, rather than genuine admiration or respect.

Success and recognition can be achieved by a woman without abandoning her essence. Modern women prove this by reaching the same level as men without becoming like them. Being courageous does not mean being a man; being feminine does not mean being weak. It's futile to expect that the complex of female inferiority

will dissolve on its own or that the male half of humanity will do it. It is sustained by the fact that women themselves believe they are incomplete or pitiful without someone's guidance. But that's not the case at all because femininity is the embodiment of light, nobility, and strength. When men and women stop seeking validation at each other's expense, they will feel a blissful relief, as the centuries-old gender war will come to an end.

In summary, society's habit of dividing and opposing has fueled the ongoing struggle for gender equality, particularly for women. Simone de Beauvoir's insights highlight the deep-rooted origins of this struggle. The lack of unity among women, influenced by societal pressures, has slowed progress. Women's historical roles as secondary to men have reinforced stereotypes of passivity. Yet, true freedom lies in challenging these norms, embracing femininity without sacrificing autonomy, and fostering unity for a fairer society.

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RECENT TENDENCIES IN THE TRANSLATION OF TECHNICAL TEXTS

Technical texts are documents and content that convey information in specialized fields and are characterized by the use of industry-specific terminology, complex concepts, and an emphasis on accuracy and precision. Such texts are common in engineering, scientific research, information technology, and a variety of technical areas.

In the technical field, accuracy is paramount. A single mistake in translating a technical document can lead to misunderstandings, product defects, and even compromise safety standards. Therefore, accurate translation plays a crucial role in

ensuring seamless communication and knowledge transfer across language and cultural barriers.

The environment surrounding technical translation is rapidly evolving, driven by technological advances and the increasing global interconnectedness of the industry. This article delves into the recent trends shaping the translation of technical documentation, from the impact of machine translation to the growing importance of subject matter expertise and specialized translation techniques.

The history of technical translation dates back to ancient civilizations, when knowledge in fields such as engineering and medicine was transmitted across cultures. In the Middle Ages, the translation of scientific manuscripts played an important role in the transmission of knowledge from Arabic and Greek texts to the Latin-speaking world, laying the foundation for the development of technical languages. With the Industrial Revolution and the rapid development of scientific disciplines, the surge of technological innovation necessitated the creation of terminology. Disciplines such as engineering and medicine developed their own specialized terminology to accurately convey complex concepts. For example, terms such as "nuclear magnetic resonance" and "algorithmic complexity" arose to capture specific ideas in their respective fields. In the 20th century, globalization and the rise of multinational corporations increased the demand for technical translation services. The digital age further transformed the situation with the advent of computer-aided tools and the Internet, which made the translation process faster and more efficient. This era saw a shift from manual translation methods to the integration of technology, marking an important turning point in the evolution of technical translation [2].

Machine translation tools, such as Neural Machine Translation (NMT) systems, have become indispensable in the field of technical translation. In scenarios where speed and volume are critical, these tools excel by quickly providing rough translations of technical documents. For instance, a multinational engineering firm may use machine translation to quickly process large volumes of technical specifications in the early stages of a project. While machine translation offers unparalleled speed and efficiency, its reliance on algorithms may result in inaccurate translation, especially when dealing with highly technical or nuanced content. For example, machine translation systems may struggle to accurately convey the complex content of software development manuals, where precise terminology and contextual understanding are critical. Understanding these limitations is essential to ensuring

the quality and reliability of technical translations. Human translators bring a depth of understanding and contextual awareness that machine translation tools do not. In technical fields where accuracy and precision are non-negotiable, human expertise is invaluable. Consider the case of a pharmaceutical company translating the research results of a new drug. A human translator with knowledge of biochemistry and pharmacology would be able to handle complex issues and communicate information accurately [1].

As an illustration, the field of aerospace engineering presents a challenge in translating specialized terminology due to the precision required. Translating terms such as "aeroelasticity" or "stratospheric windshear" demands not only linguistic proficiency but also a deep understanding of the underlying engineering concepts. Establishing a comprehensive, standardized glossary for such terms and ensuring consistency throughout the translation will be critical to maintaining accuracy.

Technical manuals often include diagrams, schematics, and charts that convey important information. Translation of these non-literal elements requires careful consideration of cultural differences and industry standards. For example, in the automotive industry, technical drawings describing engine components must not only be linguistically accurate, but also culturally appropriate to account for differences in design preferences and terminology in different markets.

In software development, where agile methodologies are widely adopted, translation of terms such as "sprint" and "scrum" requires not only linguistic translation but also an understanding of the cultural context surrounding these methodologies. Successful translation requires not only accurate conveyance of the terminology, but also ensuring that the translated content is consistent with the cultural practices and expectations of the target audience to facilitate seamless understanding and implementation.

The introduction of neural machine translation has greatly improved the quality of technical translations. Consider a scenario in the information technology field where a software company is utilizing neural machine translation models trained on a huge data set of programming languages. As a result, complex code snippets can be translated more contextually accurate, the need for extensive post-editing is reduced, and the overall translation process is more efficient [1]. AI-powered translation

platforms are now able to learn from domain-specific terminology, resulting in a more intelligent and adaptive translation process. For example, in the pharmaceutical industry, AI algorithms analyze vast databases of medical literature, allowing translation systems to adapt and generate more accurate and contextualized translations for new drug development and ensure compliance with regulatory standards. As augmented reality gains prominence in industries such as manufacturing, technical translation could expand beyond documents. AR devices with language processing capabilities could provide real-time translation of technical instructions to factory floor workers. Such integration of NLP and AR has the potential to revolutionize the way technical information is communicated and accessed, bringing a new dimension to the field of technical translation.

Exploring key trends in technical translation, from historical transitions to the integration of advanced technologies such as NMT and AI, highlights the dynamic nature of the field. Understanding these trends will provide valuable insights into the current and future trajectory of technical translation. The history of technical translation demonstrates the resilience of language professionals to adapt to new challenges. Just as translators have historically moved from manuscripts to digital documents, today's translators must embrace and leverage new technologies. The ability to innovate and integrate these tools ensures continued relevance and effectiveness in the rapidly changing technical translation landscape. As we look to the future, the field of technical translation holds immense potential for growth and cooperation. As global industries become increasingly complex and technology advances, new possibilities open up for language professionals. Translators have abundant opportunities to specialize in emerging fields where accurate communication is critical, such as cybersecurity and green technology. Embracing these opportunities will not only shape the future of technical translation, but also contribute to the seamless exchange of knowledge across diverse linguistic backgrounds.

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HAMLET IS A BASTARD

The idea that Hamlet is actually illegitimate arose when, in one of his conversations with Horatio, the prince mentions some people with a defect who aren't responsible for how and where they are born, since they do not choose their origin. According to Hamlet, the defect resulting from this misfortune causes others to look at them as spoiled [1.4.25-40].

In the context of a general conversation with Horatio, one might think that Hamlet is talking about people who are born with certain vices, for example, an excessive love of drinking, and that this defect negates all their good qualities in the eyes of others. Obviously, this meaning is more consistent with the answer to a friend's question about whether regular drinking in Denmark is a local tradition [1.4.14].

However, what if Hamlet is talking about something completely different in this case, such as his illegitimate birth? This idea is reinforced by the circumstances under which the character was born. It should be remembered that he was born on the day of the battle between old Hamlet and old Fortinbras thirty years ago [5.1.144-161]. And the reason why this battle took place, according to Horatio, was that the honor of the Norwegian king was hurt by the Danish king [1.1.90-117]. How exactly the two venerable monarchs quarreled among themselves is not specified in the text, but it can be assumed that it was a love affair.

Thus, it would be possible to explain the fact noted by Bloom H. that Hamlet's father never once throughout the entire play addressed him with love [1, p. 4]. Instead, old Hamlet once used the phrase «*if thou didst ever thy dear father love*» [1.5.28]. It is worth adding that at the age of seven the prince was sent to Wittenberg away from Denmark [1.5.172]. This decision of the king may be due to the fact that he simply did not want to see, as he believed, someone else's child under his nose.

If Hamlet were his father's real son, he could, purely hypothetically, be born the day after the battle between Denmark and Norway; and if he is the son of Fortinbras – a day earlier. But he was born on the very day of the battle, so whose son this remains unclear. Of course, if the circumstances of Hamlet's birth had no plot significance, Shakespeare might not have focused on the specific date of this event.

Due to his illegitimate birth, Hamlet finds himself relegated to a minor role at the Danish court. It should be remembered that in the reception room of the castle, the first person Claudius invited to talk was Laertes, and only after that – his own nephew [1.2.43]. It should be noted that in a room of state in the castle, the first person Claudius invited to talk was Laertes, and only after that his own nephew [1.2.43]. That is, when the prince first appears in the plot, Shakespeare presents him as a minor character.

Along with this Wilson D. comments on Hamlet's words regarding «*sullied flesh*» and writes that the prince feels involved in the lust of his mother [2, p. 42]. This allows some Shakespeare scholars to create theories that perhaps Hamlet is actually the son of Claudius, and that the latter had an affair with Gertrude even before marrying her. One of the arguments of the supporters of this theory is that Claudius, when communicating with the prince, calls him his «*son*» several times [1.2.66].

Thus, we can come to the conclusion that there is a certain problem with the origin of Hamlet: it is not known exactly whose son he is. His words about some people with a defect who do not choose how and where they are born only confirm the general points made in this article. It's doubtful that in the future it will be possible to establish Hamlet's relationship with any of the acting characters in the play. This is the eternal riddle posed by Shakespeare, the answer to which most likely never existed.

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GLOBAL CULTURAL IMPERIALISM AND ITS IMPACT ON THE MODERN INTERNATIONAL ENVIRONMENT

To begin with, it is important to mention that cultural imperialism occurs when one community imposes or exports various aspects of its own lifestyle onto another community. The term "cultural" refers to local customs, traditions, religion, language, social and moral norms, and other features of a way of life that are distinct

from, yet often closely related to, the economic and political systems that shape a community. On the other hand, the term "imperialism" indicates that the imposing community forcefully extends the authority of its lifestyle over another population by either transforming or replacing aspects of the target population's culture. In other words, cultural imperialism does not typically refer to instances when a population willingly adopts aspects of another culture into its own. Instead, the term usually denotes cases of forced acculturation of a subject population.

In the realm of international business and globalization, the issue of cultural imperialism is a prevalent concern. Historically, cultural imperialism played a significant role in colonization, where nations imposed their authority over foreign territories to exploit resources and exert political control. This process often involved military intervention, but the lasting impact was achieved through the imposition of the colonizers' culture on the indigenous population. Driven by a sense of cultural superiority, colonizers utilized legal, educational, and military means to enforce their way of life on the conquered people. This was not only a means to assert dominance but also an attempt to eliminate any resistance by eradicating local customs and traditions [0]. "One of the clearest examples of the forced acculturation of a colonized population was the Spanish influence in Latin America, beginning with the conquest of the Aztec empire by Hernan Cortes during the cultural Imperialism early 16th century. After securing their physical presence in the region, the Spanish suppressed Mesoamerican culture, forbidding the Indians to learn and transmit their culture while simultaneously requiring them to read and write Spanish and convert to Christianity. This behavior was certainly not unique to the Spanish; other examples include the British influence in India and the Dutch and French presence in the Caribbean. Today, charges of cultural imperialism often still carry this legacy of association with the historical experience of colonization" [0, p. 537].

In general, cultural imperialism emerged from a global context encompassing economic, social, political, and cultural aspects. It significantly impacted the lives of individuals, particularly in developing nations, where suppression, coercion, and neo-colonization prevailed. The concept of a global village was envisioned, but the underlying effects of globalization were often overlooked. As globalization gradually infiltrated societies, its true nature went unnoticed, leading to the ongoing debate on its merits and drawbacks. At present, there is a pervasive wind of change at local, national, and international levels, driven by the forces of globalization.

Undeniably, globalization has its roots in economics and yields political consequences. However, it has also shed light on the influential role of culture in this interconnected world, where the tension between integration and separation permeates every aspect of international relations. Representing the origin of cultural imperialism, it would be appropriate to mention that this phenomenon, which is rooted in the cultural imperialism theory by Schiller, highlights the dominance of Western nations in global media, leading to the imposition of Western views on Third world cultures and the subsequent destruction of their native cultures. Western civilization's financial superiority allows them to produce the majority of media content, making it more accessible and affordable for the rest of the world, thereby increasing sales and profits in the international market [0]. “The cultural imperialism theory is based on some tenets of the Uses and Gratifications Theory, which holes-up into the Agenda Setting Theory. The Uses and Gratification Theory explains how people use and become dependent on the media. People find use of the media for all forms of activities ranging from entertainment, Parasocial relationships to the extremes of culture. The Dependency Theory says the more a person becomes dependent on the media to fulfill his needs, the media will become more important to that individual. The media will also have much more influence and power over that individual, and thus it becomes easy for the media to set agenda. The individual thus falls victim' to Agenda Setting, crisscrossing from cultural imperialism to Uses and Gratification and then Agenda Setting theories” [0, p. 130].

Presently, mainstream and mass media are prime examples of cultural imperialism. Media serves as a significant global communication tool. It is worth mentioning that media from the culture being influenced is not transmitted to the influencing culture. The majority of global media companies are owned by advanced core nations. Cultural imperialism and global communication play a crucial role in globalization, the progression towards a globally interconnected civilization. Many believe that globalization facilitates cross-border communication and fosters diverse cultural perspectives through modern media and technology. Media imperialism stands out as a prominent phenomenon in today's world. The flow of media content reinforces its dominance [0]. “There is a point that media flows and economic power are inextricably linked; the more accessible global markets are, the more economic powers can affect them. Hollywood and Disney may export cultural commodities and values to foreign markets. Warner Brothers and Disney work with regional

production centres in Europe, Latin America, and Asia to produce regionally unique shows. Brazilian soap operas, for example, promote things via sponsors by displaying a beautiful U.S. lifestyle with a Brazilianized face and touch. The myriad of detractors consider that cultural imperialism devalues the audience's choice, agency, and free will. It ignores how background and context affect how people absorb and interpret information. It also assumes culture is fixed and unchanging, despite the complexity and internalization of cultural identity. It also ignores cultural resistance, the idea that culture may be utilized to fight repressive regimes and influential individuals. Al Jazeera was founded to provide an alternative to the Western worldview and give voice to previously silenced civilizations. Some say the Al Jazeera Effect shows the agency and cultural resistance of cultural Imperialism's targets" [0, p. 5].

In conclusion, cultural imperialism can have both positive and negative impacts on the international environment. When successful, it can promote universal values such as equality and improve the quality of life. However, the dominance of one culture can be detrimental to "lesser" civilizations, leading to the destruction of cultures and the imposition of a globalized culture. This widespread phenomenon in today's global media landscape is largely attributed to core nations controlling the majority of the world's media and spreading their cultural perspectives. The negative effects of cultural imperialism on international relations can be seen in the interactions between the United States and Kenya and Nigeria, for example. Nowadays, the concept of globalization is more relevant in understanding cultural dynamics than cultural imperialism. While cultural imperialism imposes the dominant Western culture on other societies, globalization recognizes the diversity and ever-changing nature of culture. Unlike cultural imperialism, which promotes passivity, globalization encourages active engagement from audiences. Furthermore, cultural imperialism is no longer solely focused on nation-states, whereas globalization provides a more comprehensive understanding of cultural complexities at different levels, including subnational, national, and supranational.

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VALUE ORIENTATIONS AND THE INFLUENCE OF THE FAMILY ON THEIR FORMATION

The foundation of our personalities, beliefs, and morals are often laid in the crucible of family. Value orientations, the core principles that guide our decisions and actions, are deeply influenced by the dynamics and interactions within the family unit. From the early experiences of childhood to the implicit norms that govern familial interactions, families wield significant influence over our development.

“Value orientations” are considered by us as psychological neoplasms of the personality, which make up the system of worldview orientations of the personality and are manifested in the attitude towards oneself, towards other people, and also towards society as a whole as the highest value; a high level of respect of one person for another, recognition of its independence, high purpose, belief in its capabilities and granting the right to free development and self-realization, care for the conditions of its existence (primarily the environment) [3].

In simpler terms, value orientations are a person’s values and beliefs that guide their behavior and decision-making. They are formed through a combination of factors, including family upbringing, education, and personal experiences.

The system of values of a social subject can be composed of essentially-vital ideas about good, evil, happiness, purpose and essence of life and universal ones:

- vital (life, health, personal safety, welfare, family, relatives, education, law and order);
- social (social status, ability to work, etc.);
- interpersonal (benevolence, honesty, altruism);
- democratic (freedom of speech, conscience, national sovereignty);
- particular (belonging to a small homeland, family);
- transcendental values (faith in God, striving for absolute) [1, p. 164].

During personality socialization, value orientations are shaped by the social information that enters an individual’s psychological world. The family plays a crucial role in this process, laying the foundation for our core values – what matters most in life and who we strive to become [4, p. 29].

Modeling stands out as one of the primary ways families shape value orientations. Children, with their keen observation skills, consistently take in the behaviors, attitudes, and beliefs demonstrated by their parents and caregivers. A family that prioritizes traits like honesty and integrity is more likely to raise children who internalize and uphold these values.

Furthermore, communication patterns within the family exert a substantial influence. Open and transparent communication fosters an environment where different values and beliefs can be explored. Children who feel encouraged to express their thoughts and emotions to their parents are more inclined to develop critical thinking abilities and form independent value systems. Conversely, families with authoritarian communication styles may lead children to simply adopt the values of their parents without questioning them.

Additionally, family rituals and traditions contribute significantly to the cultivation of value orientations. Regular religious practices, cultural festivities, or even simple routines like shared meals fosters a sense of belonging and reinforces common values.

However, it's important to acknowledge that family influence is not absolute. As individuals mature, they encounter diverse experiences, interact with various social groups, and engage in educational environments. These external factors can either challenge or reaffirm the values instilled by the family. The teenage years, in particular, are often marked by a period of questioning and rebellion, where individuals begin to forge their own identities and value systems. The influence of upbringing, education, and socio-cultural processes on the formation of value orientations is significant and meaningful for the younger generation. The effectiveness of this value assimilation, along with the development of needs and interests, is crucial for successful socialization. It determines whether a young person becomes a well-rounded citizen and personality, and avoids deviant behavior [2, p. 32].

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FORMATION OF THE INSTITUTE OF LEADERSHIP IN PUBLIC ADMINISTRATION OF MODERN UKRAINE

The term «leadership» comes from «leader» – someone who is ahead, leads, manages. According to the 1983 Oxford advanced learner's dictionary of current English, this term originated in the 13th century, but began to interest researchers only in the 19th century and has been actively studied ever since [1; 2]. The political dictionary provides such a definition: a political leader is an authoritative member of the organization, group, society in general, whose personal influence enables him to play a leading or significant role in political processes and situations. It is a ruler who uses any means to establish public order and maintain his rule [5, p. 436]. The sociological dictionary of terms and concepts gives such a definition: a leader is an authoritative member of the group, organization, society who plays the role of organizer, initiator of group interaction and who is perceived by this community of people through his abilities to solve problems and errands important to it [8, p. 159]. Leadership in the same dictionary is defined as a process in which certain members of a group motivate the activities of the entire group, lead it. According to the dictionary of pedagogical and psychological terms, the leader is a «team member who in important situations is able to exert noticeable influence on the behavior of team members, shows initiative in actions, takes responsibility for the team's activities, leads it» [7, p.97]. The Polish sociologist Piotr Sztompka points out that «leaders are creators of new paradigms, models and in the broadest sense of the word creators» [13].

Interestingly, despite the fact that leadership is a universally recognized phenomenon, it is difficult to find exact equivalents of this term in different languages. For example, in the Japanese language, the term «leader» does not exist at all. There is also no exact analogue of the English «leader» in Romance and Slavic languages [2, p. 15].

Many scientists and researchers point out that a leader is a person who has significant influence, a recognized authority, who is able to lead people in extraordinary conditions to extraordinary goals. And it is the ability to lead people that is a key part of the maxim, since it is people that are the potential to be

developed and directed [11, p. 15]. So, a leader is an innovator and enthusiast who inspires and motivates his colleagues, works together with them to achieve group goals and creates an atmosphere of trust and respect in the team.

It is worth noting that a leader does not necessarily have to be a manager, because a manager is a formally approved person who relies on the system and control, concentrates on the structure. A certain group of people is under the authority of the manager, regarding whose work he makes final decisions and has at his disposal official incentives and punishments. Instead, the leader is nominated spontaneously and does not have officially recognized authority and duties, he is a person «followed», an informal authority who can influence people thanks to his charisma, proactivity, strategic thinking, creativity and possession of psychological and oratory skills [12, p. 145].

Modern leadership in public administration is democratic leadership, the essence of which is the democratic behavior of leaders and the process of democratization of society. So, a modern democratic leader is a leader who possesses democratic, elite qualities and knowledge [9, p. 58].

One of main tools for the formation of the leadership of public authorities is leadership competence, which should determine the specific qualities of managers necessary for effective work, and will contribute to the formation of a qualitatively new culture of public administration. Their list is not exhaustive, but in general five main types of competences are distinguished: psychophysiological features (such as, for example, the speed and type of reaction); regulatory mechanisms (to which the authors of the concept include values, attitudes, self-concept of the individual, psychological phenomena); skills and abilities; knowledge; basic motivations [14, p. 71].

For modern Ukraine, the issue of forming a democratic leader in public administration, capable of successfully solving problematic issues for today and ensuring the country's development for the future, is relevant. One of the research directions of this issue, which is aimed at a successful solution, is the analysis of the world experience, primarily of successful countries of the world, and the development of scientifically based conclusions regarding the use such experience in Ukraine [10, p. 24-25]. For example, the institute of leadership in public administration was reviewed in the following countries: Canada, Singapore, the USA, the Netherlands, Australia and Estonia. Thus, foreign experience proves that the implementation of directions for the development of the public service, which

ensure the competitiveness of the public service, attractiveness of management activity, allows to create an opportunity for the formation of leadership qualities of specialists in the system of public administration [4, p. 59]. Also, the experience of other countries shows that the leadership strategy should: be developed from the point of view of the needs of the government as a whole; be based on a clear diagnosis of those challenges that exist; take into account the existing culture in the public sector (countries determine their competences and strategies based on relevant researches that allow taking into account national specificities, priorities and special challenges); provide comprehensive and long-term support to promote sustainable development of leadership, including training and development of leadership competencies.

Today's leaders must effectively interact with the colleagues – leaders of other industries – and influence people outside their hierarchy. This requires new skills that are different from old linear approach. A network approach is the most effective when responsibilities between the public and private sectors are intertwined. The main characteristics of network cooperation are: flexibility and adaptability, decentralized structure, shared responsibility, shared goals and vision, trust. Stimulating the development of network cooperation in the state administration system will contribute to increasing the efficiency and adaptability of organizational structures [4, p. 161]. Innovative leadership can help in this. Innovative leadership in public administration is usually understood as the process of internal social and psychological organization, management of team activities, influence on employees, which accompanied by a change in the ideas and values of the last ones, activation of higher needs for innovation, achievement, creativity, self-actualization [15].

Dr. David Gliddon, using a Delfi method, developed a model of innovative leader competencies and introduced the concept of innovative leadership at Penn State University in 2006. This model of competencies of an innovative leadership defines and describes three levels of 98 competencies, among which expert, key and additional competencies can be distinguished. Here are some of the basic competencies which an innovative leader needs.

The expert competencies include the following categories:

- the ability to learn;
- the ability to lead group and teams;
- the level of motivation and energy;
- management and delegation.

The key competencies include the following:

- interest;
- ability to identify innovations;
- the ability to identify the team's strengths and weaknesses.

The additional competencies include the following:

- communication, interpersonal skills and emotional intelligence;
- dedication and sense of involvement;
- creativity;
- power, political views and role identity;
- mission and vision;
- understanding of the external environment [15, p. 120].

A good example of the implementation of innovative leadership in public administration is the Ministry of Digital Transformation of Ukraine headed by its leader – Deputy Prime Minister for Innovation, Education, Science and Technology Development – Minister of Digital Transformation of Ukraine Mykhailo Fedorov. The Ministry of Digital Transformation of Ukraine actively cooperates with other countries, in particular, in the field of transfer of experience in creating «state in a smartphone» [6]. In addition, the Ministry of Digital Transformation of Ukraine is another example of network cooperation. For example, the Ministry of Digital Transformation of Ukraine cooperates with the Ministry of Internal Affairs regarding re-registration, car sharing, driver's license replacement, and an interactive map of shelters. Also cooperates with the Ministry of Education on issues of transformation of the school and higher education system. Another example can be the cooperation with the Ministry of Defence regarding the simplification of passing the military medical commission for the military thanks to digitalization; simplifying and speeding up the procedure for admitting drones to the front. In addition to state institutions, the Ministry of Digital Transformation of Ukraine also cooperates with private companies, include foreign ones. Among the recent examples, memoranda of cooperation were signed with Cisco, Palantir, Recorded Future, Amazon, Kyivstar, Vodafone, and others.

Thus, the institute of leadership is a result of the implementation of changes in the system of public administration, aimed at increasing the efficiency and compliance with modern challenges. Strengthening leadership competencies and promoting development of leaders in the field of public administration is a strategic direction for achieving high performance indicators.

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STRUCTURE OF THE ENGLISH MEDICAL TERMS

Terms, like ordinary words, are mostly formed on the basis of the existing words and roots of general literary and special vocabulary. Among the terms, there are all the structural types of words that are characteristic of a given national language.

As part of one-word medical terms, there are three main structural types of terms: simple, affixed and complex terms. Under simple (or root) terms, it is customary

to understand one–word terms, the basis of which coincides with the root: *index, back, balm, cell, cancer, diet, disease, neck, nerve, pill, raw, sac, vein, womb, cast, sole, sore, rib, lap, leg, lichen, limp, mole, mucus, nape, navel, plica, pile, pox*; affixed terms include one–word terms, the stem of which contains a root and affixes: *discomfort, deterioration, abnormality, implant, incision, coefficient, resorption, resuscitation, intrabronchial, messenger, rubber, saponification, widening, wetting, revaccination, poisoning, rotator, reproducibility, malingerer, marantic, fetid, sensibilization*; complex terms include one–word terms that contain at least two root morphemes: *aid–man, airproof, bedfast, biodegradation, bloodstream, bottle–fed, brainstem, cardiography, cardiovascular, deadborn, deadmute, fiberscope, radiogenetics, lymphoblast, lysine–cystinuria, magnetocardiography, plethysmography, self–analysis, hystero-colposcopeagar–tube, gallstone* [1].

The simplest and at the same time the most common type of compound terms in the English terminology is a two–component attributive phrase, consisting of a nuclear element – a noun in the nominative case and an attributive, defining element. Common types of two–component terms in the English medical vocabulary are.

1. Attributive phrases with an adjective in the function of the prepositive definition: *microfocal radiography, metabolic rate, infrared rays, ultimate recovery, open reduction, multiple sclerosis, gastric secretion, nasal septum, antitetanic serum, supraventricular tachycardia, soft abdomen, cold abscess, salycilic acid, aural calculus, occult cancer, determinal factor, postvaccinal immunity*.

2. Attributive phrases with a noun in the function of the prepositive definition: *microbiology laboratory, elbow joint, life history, blood serum, hepatitis virus, leg ulcer, motor nerve, lupus nephritis, scrub nurse, duct orifice, food passage, bile peritonitis, head physician, finger plethysmography, drug poisoning, action potential, water pox, skin rash, heart rate, infection rate, addition reaction*.

3. A significant number of medical terms (mainly the names of diseases) the first component of which denotes a proper name, the carrier of which is usually the creator of this term: *Alanson's amputation, Alzheimer's disease, Down's syndrome, Robson's point, Kocher's forceps, Sutter's blood, Burkitt's lymphoma, Bell's mania, Gram's (staining) method, Coffey's operation, Erb–Charcot's paralysis, Trendelenburg's position, Friedman's reaction, Freyer's operation, Nelaton's catheter* [2].

A review of the types of English two–component terminological phrases allows us to conclude that the most typical are phrases formed by defining the original term, in which adjectives and nouns act as an attributive word.

Composite terms are combinations in one word of two or more root morphemes: *framework, frostbite, gamma-chamber, gastroduodenoscopy, gastrointestinal, heatstroke, hemochromatosis, high-toxic, hysterosalpinograpy, juxta-articular, kidney-shaped, knock-knees, macroglobulinemia, microspherocytosis, monoaminoxidase, morphogenesis, mucopolysaccharide, nephrocystosis.*

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HOW TO DEFINE CHINESE-AMERICAN LITERATURE

Chinese-American literature as a component of Asian-American literature and American literature in general became known in the field of literary studies only in the 1970s [4]. The movement for civil rights in the USA in the 1960s became the impetus for rethinking the significance of works written by people with Chinese background [3]. Later, this contributed to the publication of anthologies of prose and poetry by Asian-American writers.

The famous American writer and playwright of Chinese origin, Frank Chin, in the preface to the anthologies «Aiiieeeee!: An Anthology of Asian-American Writers» (1974) noted that the place of birth of a writer should not determine whether his works belongs to the field of Chinese-American literature. He believed that the measure of the Asian-American nature of works should be «the birth of sensibility». In the concept of «sensibility», Frank Chin invested not personal experience of life in China, but research into Chinese history, culture, philosophical thought conducted by the writer, information carefully collected by him, embodied in a literary work [2].

Shirley Geok-lin Lim and Amy Lin in the collection of essays «Reading the Literatures of Asian America» (1992) significantly expanded the concept of

Asian-American literature, seeing it as a holistic phenomenon [3]. They considered it necessary to study such works from a historical perspective, so they included works written in Asian languages, autobiographies of first-generation educated emigrants, and even notes of Asian tourists in the United States of America.

King-Kok Cheung and Stan Yogi in the book «Asian American Literature: An Annotated Bibliography» (1988) associate Asian-American literature with all North American Asian literature [1]. Researchers explain such a broad vision by the fact that this literature is only at the initial stage of formation, so the place of birth, generation of emigration of writers is not important.

In the understanding of modern scientists, when defining Chinese-American literature, it is impossible to separate the Chinese and American parts of the literary works of emigrant writers, since **Chineseness** is their foundation, and Americanness is their home [4]. Without any of the components, such literature cannot fully exist, and therefore must contain works in both English and Chinese written in the United States, regardless of the author's place of birth.

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DEFINITIVE ANALYSIS OF THE CONCEPT OF "PUBLIC ADMINISTRATION"

In Ukraine, a war has been ongoing for 10 years, of which 2 years are of full-scale military aggression from Russia. The country is experiencing significant changes affecting both the lives of citizens and the functioning of state bodies. New challenges are caused by the increase in tax burden: mobilization of the population, cost of living, impossibility to plan for the future, fear that the front line could change any

day. As a result, we see an increase in social tension, expansion of dissatisfaction with state management, which could lead to extremely negative phenomena.

Therefore, it is currently relevant to seek ways to prevent the escalation and reduce social tension, which, in our opinion, can be done through increasing trust in the authorities in the country and providing quality public services. This goal can be achieved through improving the quality of public administration by refining and analyzing the concept of "Public Administration" more thoroughly.

Understanding the essence of the concept of "public administration," its detailed analysis combined with the comprehension of its construction and development can be considered one of the most priority national tasks of the state in current conditions.

Analyzing the concept of "public administration," it is especially interesting to explore what contributed to its definition and development, what led to the transition from "state management" to "public administration".

To understand the dynamics and difference between the concepts of "state management" and "public administration," it is necessary to define them and identify their common features and differences.

Researching the concept of "state management", it is noted that in the Encyclopedic Dictionary of State Management, "state management" is defined as the activity of the state aimed at implementing state functions, rights, and freedoms of citizens, ensuring the development of society. Over time, especially with the development of democracy, the approach to state management evolved, emphasizing the importance of interaction between the state and civil society. The importance of a systemic approach to management is highlighted, which includes mission, structure, resources, and administrative culture.

Max Weber defines state management as a specific type of activity that differs from other forms of state power implementation. In Ukraine, state management is recognized as a type of activity, a scientific field, and an educational specialty [4, p. 150].

In turn, as the state focused on European integration, state management in Ukraine underwent changes and covered targeted actions of the state for the integration of society into the European space. This includes the implementation of reforms and the use of resources to ensure societal development and adaptation to EU standards, promoting the creation of effective management structures, and strengthening democracy and civil society [4, p. 152].

According to V. Martynenko, state management represents a process in which authoritative management is exercised through the creation and implementation of a system of executive bodies at all administrative-territorial levels of the country. They use various means, mechanisms, and methods to influence society for its management [8, p. 21].

Professor T. Kolomoiets outlines state management as a system where state bodies perform certain functions of the state, which in a narrow sense represents the totality of these bodies and their activity. In a broader context, state management is seen as a type of social management reflected through the activities of state bodies regulating societal relations in the interests of the state [5, p. 96-97].

As we see, "state management" was not human-centric and could not fully meet the needs of people. Among the most significant shortcomings of "state management" are the inability to satisfy the needs of modern society and citizens' dissatisfaction with the large number of state institutions and the low quality of state services.

These factors contributed to the implementation of a series of reforms to improve state management and, as a result, meet the needs of the population. Reforms led to changes in societal relations with the state from "command and control" to "motivate and achieve results". It is determined that modern approaches to societal management include the transition from traditional methods based on the application of authoritative powers to more flexible strategies, as well as changing bureaucratic procedures to those oriented towards the quality of public services. These changes facilitated the emergence of a new form of management in the public sector, known as "public administration", which became a logical development in the field of state management.

Researching the concept of "public administration," it is noted that in the Encyclopedic Dictionary of State Management, "public administration" is defined as the search for the best ways to use resources to achieve the state's priority goals: public management is aimed at realizing the rights, freedoms, and lawful interests of private individuals and implies the fullest application of the principle of publicity – openness and transparency of its apparatus's activity, the right of citizens to influence the activities of authorities, public control over the management apparatus, etc. [4, p. 605].

According to T. Kondratyuk, public administration is considered as a part of the social structure of society that interacts and develops under the influence of various aspects of societal life [7, p. 298].

According to V. Averyanov's definition, public administration represents a set of executive authorities and self-governing institutions under the leadership of political power. These bodies are responsible for compliance with laws and performing various functions in the field of public management [2, p. 117].

According to O. Amosov and N. Havkalova, public administration encompasses the entire complex of direct interaction between citizens, state, and non-governmental organizations. It includes the processes of planning and managing social initiatives at the local or regional level, as well as relations concerning both official institutions and informal agreements based on integrated resources – human, intellectual, and social capital of citizens, which are fundamental for democratic archetypes [1, p. 8].

V. Kolpakov describes public administration as a process in which subjects of public administration exercise their managerial powers to implement authoritative decisions and policies. This process includes the application of various management methods, providing administrative services, participating in legal relations on issues of responsibility, and taking measures regarding violations of rules established by public administration [6, p. 101-104].

According to the United Nations, the concept of public administration covers two interrelated areas: firstly, it is a comprehensive state mechanism that includes policy, norms, procedures, organizational structures, and personnel funded by the state budget, responsible for managing and coordinating the activities of the executive branch, as well as interacting with other stakeholders at the national and international levels; secondly, it is the management and implementation of a wide range of state initiatives related to the legislative implementation, adoption of government decrees and decisions with the aim of providing public services. These aspects highlight the importance of public administration both for the effective operation of the state apparatus and for meeting public needs through the provision of critically important services [3, p. 34–39].

Therefore, if we compare the concepts of "state management" and "public administration," state management has a narrower character, with the state and state power being key elements for it. It is also evident that there is a diversity of views on the concept of "public administration" in the literature.

Some scholars view it as a process of implementing public authority, others as the activity of a public administration subject, and yet others as a totality of government bodies, etc.

Analyzing all the above, we consider it appropriate to strengthen the concept of "public management" with the provisions of the Ukraine Constitution and provide our definition of it. From our point of view, public administration is a dynamic process of exercising authoritative powers by state authorities and local self-government focused on the individual, their life, health, honor, dignity, inviolability, and safety, aimed at ensuring the implementation of laws and other normative-legal acts passed by legislative bodies that are important for society and the state, which ensures effective interaction with representatives of civil society and the private sector, ensuring the right of public influence on the activities of authorities and public control. In exercising authoritative powers, the principles of legality, publicity, openness, and transparency of activity must be observed.

In conclusion, it can be stated that public administration today is a complex system located at the intersection of governmental structures and civil society, which is developing towards ensuring democracy, transparency, and accountability in relations between the state and society. Public administration goes beyond the mere execution of laws and managerial decisions and also includes the development and implementation of policies that meet societal needs, promote its development, and ensure a high standard of living for citizens.

An important aspect of public administration is its ability to adapt and innovate, the use of the latest technologies and management methods that allow not only to respond to current challenges but also to anticipate future changes and societal needs. Such an evolution of public administration requires professionals in this field not only to have deep knowledge in law, economics, political science, but also competencies in IT, change management, and innovative management.

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THE NUDE ART IN THE MIDDLE AGES AND RENAISSANCE

The "Nude" genre in painting expresses admiration for the nude. The history of this genre has its roots in ancient times, when works of art, frescoes, paintings and sculptures were extremely saturated with such images. Among them were the deities and heroes of mythology who were on Olympus. Initially, both naked men and women were depicted in this genre. But over time, it became common to depict exclusively female nature. The naked body continues to be an object of various reflections, even with its visual popularisation in modern society, where fashion trends promote greater sympathy for partial openness and clothing defects.

Medieval society was based on scholastic views. It is therefore not surprising that this genre was influenced by the church. With the spread of Christianity, this type of artistic expression came under its control. The Greco-Roman tradition of depicting the nude lost its importance and was rejected, condemned and persecuted as a manifestation of pagan idolatry. Christian ideology placed the human body in the context of feelings and physically, as if connecting it with the earthly [1, p. 237].

The church has always looked at eroticism with hostility and severe criticism in art. Church art mainly depicted biblical and festive scenes, such as the life of Jesus Christ, the Crucifixion and the Salvation. The use of the nude was limited and allowed only in cases where it was justified from the point of view of sacred texts. An example of such representation is the scenes from the biblical myth of Adam and Eve and the original sin [5].

But there are numerous instances of eroticism in medieval art. Some manifestations of eroticism are clearly noted in Giotto di Bondone's frescoes for

the Chapel in Padua, which are dedicated to Our Lady of Grace. The entrance wall depicts the Last Judgement from the Bible, which serves as a vivid warning to pilgrims about the need to lead an ascetic life. In this visual representation, the dead meet Christ, who is seated in the centre, and can be given to Heaven or sentenced to eternal torment in hell [4, p. 26].

Next to the flames of hell, naked bodies are seen hanging on a tree and being cruelly punished for their sins. Giotto used the image of the naked body in his art to embody the temptations of the flesh in living forms, and his realistic style conveyed this issue extremely expressively.

The previous contempt for secular life, which the church called "contemptus mundi" and which had long defined medieval art, began to change under the influence of a new artistic movement, especially from the fourteenth century onwards. Jean Fouquet's famous painting «The Virgin and Child Surrounded by Angels» is a clear manifestation of the artist's bold and free expression. The Virgin's breasts in this painting are left open, and her son Jesus Christ, sitting on her lap, is fully reproduced with his genitals exposed. It is difficult to recognise earlier images of the Madonna in her face, as it seems to be an idealised portrait of the mistress of King Charles VII of France, Agnes Sorel, who had died several years earlier and was known for her great beauty [3, p. 56-57].

The beginning of the sixteenth century, known as the «Cinquecento», is recognised as one of the greatest periods in the history of Italian art and perhaps the greatest of all time. It was a time when such important artists as Leonardo da Vinci, Michelangelo, Raphael, Titian, etc. stood on a pedestal. It was during this period that the largest number of outstanding paintings depicting nudes could be noted. The Renaissance artists, inspired by the classical ideal and the spirit of antiquity, which lost its significance after the spread of Christianity, freed art from religious dogma. Thus, the beauty of this world, with a focus on the human being, became the central element of extraordinary artistic creativity, which was enriched and enhanced by the ancient spirit that began to recover. This period was also the time of Neoplatonism and the great tradition of Platonic science, which helped to further strengthen the influence of ancient ideas on art, literature, theology and philosophy.

Sandro Botticelli's «The birth of Venus», one of the most famous and beloved paintings of all time, best exemplifies this combination of neo-Platonic concept and

artistic realisation. The artist's pose of Venus and the modest way she tries to hide her breasts and groin is reminiscent of the Venus Pudica type. The background, environment, and decoration of natural elements, as well as the drapery of the figures and the chosen colours, have certainly retained some of their Gothic, medieval character, reminiscent of modern tapestries [2, p. 215].

The naked human body is a necessary component of our existence. We live and breathe in our body, and it is always our companion. In art, nudity can be accepted, permitted, or controversial. Its aesthetic character is determined by a combination of feelings and order, eroticism and reason, reflecting the traditions of ancient Greek and European philosophy. Therefore, it is important not to impose moral judgements on masterpieces that reflect the nude, both in antiquity and in our time.

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PROBLEMS WITH MODERN SECONDARY EDUCATION IN UKRAINE. OPTIONS FOR SOLVING THESE PROBLEMS

The modern system of secondary education in Ukraine faces a number of problems that require a systematic and comprehensive approach to their solution. These problems have a negative impact on the quality of education, the motivation of students and the level of their preparation for further life. Especially in the conditions of martial law and the transition to online education, led to even greater complications both on the part of students and on the part of teachers.

Outdated educational programs are one of the most important modern problems. World processes of globalization and integration, overproduction of information, growth in mobility lead to a rapid update of knowledge by increasing its volume [1]. Many programs do not meet the current needs of the labor market and have not been updated for many years. This leads to a sense of redundancy and lack of motivation. Old textbooks lack real-life tasks. A solution to this problem is updating the curriculum. By making them more flexible, practice-oriented, visual, and appropriate to modern needs, it will be possible to take the first step towards a better level of education.

Another major problem in education is insufficient funding. Schools are underfunded, which leads to a number of problems. Outdated material and technical base, this can vary from the lack of modern computers in computer science classes and projectors, to old windows and unrenovated desks. Lack of qualified personnel, growing demand for secondary education requires an increase in the number of employees. Due to the low salaries of teachers, few people are willing to become teachers, which leads to a shortage. The solution requires an increase in funding for education. More money should be spent on modernizing schools, increasing teacher salaries and purchasing modern equipment.

A very important problem is the inefficient evaluation system. The traditional knowledge assessment system does not always provide an objective picture of students' success and does not stimulate them to study independently. EIT and NMT exams do not test knowledge and deep understanding of the content of subjects, but the «grinding» of the material. This leads to the fact that after exams, children quickly forget what they studied. Another problem is that the approach to assessments is not individualised. Evaluating all children according to the same criteria leads to a misunderstanding of the growth of an individual child. Children are afraid of getting a bad grade, so they prioritize getting a good grade over gaining knowledge. The solution may be the introduction of new assessment methods. Use more diverse and interactive assessment methods that would stimulate independent and critical thinking of students.

Lack of inclusiveness. The education system is not always adapted to the needs of children with special educational needs. Accounting for children with disabilities of psychophysical development in Ukraine is 1.5% of the child population (according to the Department of Medical Statistics of the Ministry of

Health of Ukraine). 12.2% – according to regional PMP Consultations. There is no complete statistical state registration of children with special psychophysical development. Schools should have specialized classes and classrooms for children with disabilities, currently very few schools have them. Teachers do not know how to behave when faced with a student with special needs, which leads to a poor level of education and isolation of the child. It is necessary to create conditions so that children with special educational needs can receive quality education, conduct trainings for teachers, assign additional help to teachers who have such children in their classes.

A very urgent problem at the moment is the low level of student motivation. Many students do not see the value in education, which leads to low performance and a lack of interest in learning. This problem is related to all the previous ones: the problem of an old curriculum, outdated material and technical bases and an ineffective evaluation system all affect the motivation of students. It often happens that the child is sent to school when he or she is not yet ready, this can happen due to the mistaken opinion of parents who believe that the child is ready for school because he or she knows a lot for his/her age. But intellectual readiness is not synonymous with psychological readiness. If an unprepared child is sent to school, he or she is not ready to receive information, which will lead to misunderstanding, and then to unwillingness to learn. Comparison with other children also demoralizes the child. To increase the motivation of students, it is necessary to use interactive learning methods, give students the opportunity to choose the learning trajectory and show them the practical value of education [3].

Conclusion: solving the problems of modern secondary education in Ukraine requires the joint efforts of the authorities, teachers, parents and students. Only with a comprehensive and systematic approach to this problem will it be possible to achieve qualitative changes in the Ukrainian education system.

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ABBREVIATIONS IN SCIENTIFIC AND TECHNICAL TEXTS

The most important feature of any genre of scientific and technical literature is the logic of the statement, which is achieved by the sequence of evidence, the introduction of precise definitions and formulations, and the sequence of conclusions. The effectiveness of evidence is achieved by skillful use of various comparisons and analogies, which contribute to greater emotional coloring of the text. Clarity of presentation is also an important stylistic feature of texts of this kind. Clarity is achieved not only by illustrative verbal and pictorial material, but also by schematic and appropriate organization of the text itself, which is divided into chapters, sections, and paragraphs. Especially important places are highlighted in italic or bold font, attention is emphasized with underscores, points and sub-points are marked with letters or numbers. In addition, texts belonging to scientific and technical materials are usually provided with various illustrations and drawings with captions. This illustrative material contributes to a more complete understanding of the general content of the text [1].

Despite the fact that an important characteristic of the language of English scientific and technical literature is the use of a large number of special terms and terminological combinations, it includes a significant percentage of words in general use. Most of such commonly used words are polysemantic words. In some cases, in order to extract the meaning of a polysemantic word, it is not enough to use only grammatical signs, that is why it is necessary to take into account its lexical connections.

The lexical composition of English-language scientific and technical material is characterized by the wide use of terminological combinations and terms (as well as phrases and clichés), and in addition, the presence of words that denote the names of companies, brands of various technological equipment, the location of this or that enterprise, etc. As a rule, such lexical units are not subject to translation, but are transferred in their original form or in transliteration. A cliché is a stereotypical word or phrase. They include idioms, stable combinations or sets of ready-made expressions [2].

In English-language scientific and technical texts, a significant place is occupied by various types of abbreviations. Since they function independently, are fixed in lexicographic sources and often become more famous than their sources

(*radar, sonar, laser*), they can be considered lexical units of scientific and technical language. In the English language, it is customary to divide all shortenings into abbreviations and acronyms. Abbreviations are formed from the initial letters of significant words of the phrase: *AA (antenna array) antenna array, RWM (read-write memory) RAM, kVA (kilovolt-ampere) kilovolt ampere*. When pronouncing them by letter names, the emphasis falls on the last letter. Abbreviations may be written with periods, but are generally avoided in modern English.

Acronyms are shortenings that, unlike abbreviations, are read and perceived as ordinary lexical units. Acronyms are formed from different combinations of letters (from the first letters, from the first few with the last, etc.). These include the above-mentioned abbreviations *radar, laser, maser*. It is significant that the translation equivalents of these units in the Ukrainian language are precisely these acronyms: radar (Radio Detection and Ranging), laser (Light Amplification by Stimulated Emission of Radiation), maser (Microwave Amplification by Stimulated Emission of Radiation).

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THE STRUGGLE OF UKRAINIAN DISSIDENTS COMPARED TO THE DISSIDENT MOVEMENT OF VACLAV HAVEL

As it is stated in the Oxford Learner's Dictionary "Dissident – a person who strongly disagrees with and criticizes their government, especially in a country where this kind of action is dangerous" [1].

The struggle for the freedom, ideas and motherland of Ukraine has existed for many centuries, but universal ways to achieve it still have not been devised. During the period of the Great War, self-identity and the struggle for freedom became pressing issues for survival in Ukraine. One of the ways to achieve independence from

the aggressor was dissent. A successful representative of the dissident movement in the world is Vaclav Havel, who fought for the independence of Czechoslovakia for 40 and more years by journalistic, literary, and demonstrative means, because the country was occupied by the USSR during the second half of the twentieth century. As a result, Vaclav Havel succeeded in getting independence for his country and was elected President of Czechoslovakia in 1989 and later President of the Czech Republic in 1991.

Ukraine also has its dissidents whose attention is worth focusing on in our hard times of the country's struggle for independence, preservation of self-identity, national traditions, and culture. The purpose of our research is to explore and compare results of the activities of dissidents using the example of the life and work of well-known Ukrainian dissidents – Vyacheslav Chornovil, Levko Lukyanenko, Vasyl Stus, in comparison with the activities of the Czech dissident Vaclav Havel.

For a productive research, it is necessary to describe example of successful dissident – Vaclav Havel. Vaclav Havel – a Czech dissident and literary figure, known for his anti-communist views and active opposition to the totalitarian regime. He was the leader and initiator of "Charter 77" and the "Civic Forum". From the beginning of his career, he was under the scrutiny of the soviets due to his publications and speeches against the communist regime. His work, such as "Protocols," sparked significant discussions in society and attracted the attention of the soviet government. Vaclav Havel was an active participant in the human rights organization "Charter 77," which aimed to draw attention to violations of rights and freedoms in Czechoslovakia. His works, such as "The Power of the Powerless," exposed the dangers of post-totalitarian regimes and drew attention to ideological manipulations. In October 1979, Havel was arrested to four years for "attempting to overthrow the existing government". Due to a severe illness, Vaclav Havel's physical condition noticeably deteriorated, give more challenges to his dissident activities. During the period of the decline and collapse of the USSR, which began to introduce pluralism and democratization into its institutions, processes of collapsing were initiated, leading countries that were part of the Soviet Union and members of the Warsaw Pact to actively start processes of leaving the USSR. As a result of the weakening influence of the USSR on Czechoslovakia, Vaclav Havel formed the Civic Forum – a socio-political organization initially conceived as oppositional to the leadership. In Czechoslovakia, the Civic Forum played a significant role in the Velvet Revolution. In Slovakia, the equivalent

of the Civic Forum was the organization "Public Against Violence." On the evening of November 19, 1989, representatives of Czechoslovak opposition organizations gathered at the Dramatic Theatre to form the Civic Forum to fight against the communist regime. After the peaceful dissolution of Czechoslovakia, Vaclav Havel, the last president of Czechoslovakia, became the first president of the Czech Republic. Havel's presidency led to significant changes in Czech society, including the Czech Republic's accession to NATO and the starting European integration processes.

We have a model that we will compare with three Ukrainian dissidents. It is worth starting with the first one. Vyacheslav Chornovil, one of the founders of the "People's Movement" and the "Ukrainian Helsinki Group", was a Ukrainian dissident, writer, and active critic of the Soviet regime. He was arrested several times for his anti-Soviet views. In 1966, he published the research "Justice or Recidivism of Terror?", which became one of the most prominent examples of Ukrainian journalism of that time. In this study, he exposed the repressions of the Soviet government. For this and other publications, Chornovil was arrested again. His book "The Madness of the Mind" was distributed abroad, and the international community spoke out in defense of the imprisoned. For his books, Chornovil became a laureate of the prize for the best journalists in the world defending human rights; and from the Soviet Union, he received his reward – a new prison term. The active struggle continued for over twenty years, and during the period of the USSR's collapse, in 1988 Vyacheslav Chornovil initiated the creation of the Ukrainian Helsinki Union, which he conceived as a political party from the outset. He was its co-chairman, as well as a co-author of its programmatic documents, including the "Declaration of Principles of the Ukrainian Helsinki Union," which was published on July 7, 1988 on the rally in Lviv, where located 50.000 people. Ukrainian Helsinki Union became the first oppositional Communist Party of a party type in Ukraine. Vyacheslav Chornovil played a key role in the Ukrainian dissident movement, starting from his involvement as a working secretary and member of the Ukrainian Helsinki Union, and later leading the organization's press service. He was an active writer and editor, disseminating ideas through Radio «Freedom» and «samizdat». Chornovil founded the People's Movement of Ukraine, which serves as an alternative to the Civic Forum, in our point. Vyacheslav Chornovil is a successful and exemplary model of the Ukrainian dissident movement, but we should not forget about other important

individuals who fought and sacrificed their lives for Ukraine's independence – Levko Lukyanenko and Vasyl Stus.

Levko Lukyanenko, a Ukrainian dissident and human rights activist, is known for his active struggle against the Soviet regime and for human rights. Since the 1960s, he has been actively opposing the policies of the Communist Party. Lukyanenko was one of the co-founders of the anti-Soviet organization "Ukrainian Workers and Peasants Union", which promoted ideas of nonviolent resistance and political activism. He openly opposed military struggle, convinced of its ineffectiveness in fighting the Soviet regime. Upon his first arrest, he served his term in one of the camps in Mordovia, where half of the prisoners were Ukrainians, including former soldiers of the Ukrainian Insurgent A. In the late 1960s, Ukrainian dissidents began to be arrested and to be sent to the camps, and political life became so active so hundreds of the most active prisoners were transferred to the famous Vladimir Central Prison. In 1970, they were returned to the camp in Mordovia, where the prisoners began to declare hunger strikes with a series of demands, including the observance of prisoners' rights and be transferred in Ukraine. He also actively supported the activities of the Ukrainian Helsinki Group, which was established in 1976 to defend human rights and political prisoners in the USSR. Lukyanenko became its leader and played a key role in its development. For engaging in active anti-Soviet activities in June 1978, he was arrested again to 10 years in prison and recognized as a particularly dangerous prisoner. Soon he found himself back in the same Mordovian camp where he began serving his first term. On August 23, after the coup in Moscow, he was among the radicals who immediately proposed declaring independence for Ukraine. It was Lukyanenko who wrote the draft Act of Independence of Ukraine in his notebook on August 23, which was approved on August 24, 1991. According to sources, initially the document was supposed to be called a «universal», but the name was changed so that the communist majority would not refuse to vote due to the allusion to the times of the Central Rada of Mykhailo Hrushevsky. For the same reason, the formulation "restoration of statehood" was removed from Lukyanenko's draft and replaced with "declaration". The majority in the Parliament were communists, although at that time they were confused. This indicated that the communists remained in power at that time – which was the reason for the inability to hold higher state positions to complete Ukrainian dissident`s task.

Vasyl Stus was an outstanding Ukrainian poet, writer, human rights activist, and dissident. His name became a symbol of indomitable spirit and relentless struggle for freedom and human rights under the conditions of the totalitarian Soviet regime. One of the bravest demonstrations of their position took place in September 1965 during the premiere screening of Sergei Parajanov's film "Shadows of Forgotten Ancestors" in Kyiv. At the premiere, Vasyl Stus and Chornovil threw a call to the audience: "Whoever is against tyranny – stand up!" – and they themselves were the first to rise. This act of open protest against the repression of the Ukrainian intelligentsia was marked by a symbolic call to fight for freedom and human rights. At the premiere, the Soviet security service appears, and arrests begin. From this moment, Vasyl Stus officially begins his struggle against the Soviet government, which also adds him to the lists of those arrested. The Soviet government transferred Vasyl Stus into exile. In 1979, after returning from exile, Vasyl Stus joined the Ukrainian Helsinki Group of human rights activists. He openly defended the persecuted members of the group and spoke out against systematic human rights violations in Ukraine. Against the background of political repression and restrictions, Stus continued his literary activities and public advocacy for freedom of speech and expression. His work aimed to express national identity and fight for the rights of the Ukrainian people. In 1980, Vasyl Stus was arrested again and sentenced to long-term imprisonment. He died in prison in 1985 under terrible conditions of detention.

Ukrainian dissidents, like Vyacheslav Chornovil, Levko Lukyanenko, and Vasyl Stus, represent an important category of individuals who actively fought for national freedom, self-identity, and independence of their peoples within the context of the Soviet regime of the past century. They emerged as key figures in the struggle against repression and oppression, turning from social activism to political resistance, and became symbols of opposition in their countries. Their efforts and sacrifices became a crucial factor in creating democratic values and supporting human rights. They opposed violations of rights and freedoms, including political regime terror. Vyacheslav Chornovil, Levko Lukyanenko, Vasyl Stus, and Vaclav Havel actively advocated for reforms aimed at strengthening the rule of law, protecting civil liberties, and supporting human rights. In our opinion, compared to Vaclav Havel, Ukrainian dissidents lacked opportunities to build a political career in an already independent country. Vaclav Havel had successful decision to defeat

the communists in the Czech Republic, whereas in Ukraine, even after independence, they were given top positions, interrupting Ukrainian dissidents from realizing their vision of an independent country.

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COMPARING THE WORK OF SPEECH THERAPISTS IN UKRAINE AND GERMANY

The aim of this paper is to overview the state of modern speech therapy practice in Ukraine and Germany, in particular, patient management, use of methods and technologies, accessibility of services and the role of speech therapists in the healthcare system.

When it comes to professional standards and qualifications, Ukrainian speech therapists usually have a university degree in speech therapy, but often face a lack of official recognition of their profession and no regulation of working hours. In contrast, in Germany, speech therapists undergo a rigorous qualification procedure, are licensed to practice, and are required to meet established professional standards.

Considering the accessibility of services, in Ukraine, the access to speech therapy services is often limited due to insufficient funding for the healthcare system and a lack of specialists in the field. In Germany, however, speech therapy services

are available to all citizens through health insurance and a well-developed medical care system.

If we compare the methods of work, we will notice **thatspeech** therapy practices and methods may differ in both countries. Ukrainian speech therapists are more likely to use traditional methods of speech development, while in Germany they use innovative and scientifically based methods. In Germany, the initial consultation takes place during the so-called anamnesis. Contact is established with children in a gentle and playful way, and the child's vocabulary, language comprehension, grammar and pronunciation are assessed and analyzed in the form of games and tests. Contact with patients with neurological disorders also takes place in the presence of relatives and, if they wish, participation in therapy so that they can practice at home.

Another aspect we analyze is collaboration with other specialists. In Germany, speech-language pathologists are more likely to collaborate with other medical and educational professionals, such as doctors, psychologists and teachers, for a comprehensive approach to treating and supporting children with speech disorders.

As for funding, Ukrainian speech therapy institutions often face financial constraints and insufficient funding from the state. In Germany, a more significant part of the costs of speech therapy services is covered by the health insurance system.

Scientific basis. In Germany, speech therapy has a more developed scientific base, which allows for the use of advanced methods of diagnosis and therapy of speech disorders. Integrated use of linguistic and non-linguistic means for communication, communication in specific social and every day situations, the ability to navigate in a communication situation, initiative in communication, restraint in communication; culture of speech communication.

Thus, the development of a child's speech is a very complex mental process that should not be reduced to the reproduction of what a preschooler has heard. In order to talk about sufficient and adequate speech development for the child's age, it is necessary to take into account the degree of formation of relevant knowledge and skills. In order for the child's speech development to occur naturally and naturally, the preschooler should be involved in various forms of activity: playing games, attending various classes, trying to solve various problem or conflict situations.

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V. Tsymbalov

THE PROBLEM OF RELATIVITY OF THEMATIC AND SEMANTIC CLASSES OF MEDICAL VOCABULARY OF AN INTERNATIONAL LANGUAGE

Medicine is one of the basic fields of activity. In the XXI century it began to take huge steps forward, constantly ensuring the progress of humanity. A lot of knowledge was discovered, which significantly changed the scientific picture of the world.

It must be said that with the advent of the global network, the process of transmitting information has become much easier, mainly due to the speed of arrival. From the very creation of the World Wide Web, the English language began to play a key role as a way of communication between scientists of different nations.

In this regard, it is very important to analyze the phenomena and processes in the international language. The English language gave an unusual impetus to the expression of the medical branch in the vocabulary. We have this effect thanks to the heterogeneity of this language. On the one hand, the international language contains Germanic roots and ways of creating words. On the other hand, English has undergone a very powerful Romance influence, where Greek vocabulary was one of the important components.

Medicine, like any other field of knowledge, functions through its own terminology. We can suppose that medical terms in the English language contain at least three types of thinking and vocabulary origins. Such a combination of resources made it possible to preserve and spread the accumulated Eurocentric research experience in the medical branch.

It should be noted that for the rational use of human achievements in medicine, it is extremely important to systematize and clearly divide the terminology of the field.

Based on our study of medical English vocabulary distribution according to thematic and semantic principles, we can point to a certain relativity of drawing clear boundaries between classes.

For example, consider the word *eye*. It is obvious that it is in general use. It can be heard in everyday life, outside of science. For example, on the Oxford Learner's Dictionaries website, we have the following among the meanings of the word fourth: “a particular way of seeing something” [1]. That is, in this fourth meaning *eye* generally has more to do with the philosophical realm than with the medical one.

On the other hand, *eye* denotes a purely medical concept. As indicated by Taber's Medicine Dictionary *eye* – “The organ of vision” [2]. Then, this word can be included both in the class of interdisciplinary vocabulary and also in the class of narrow branch vocabulary among the terminological classifications.

The relativity of class definition also appears in the question of subclass. If we take into account the class of purely medical narrow-field vocabulary, then we will find that *eye* can be attributed to the general subclass “Anatomy, parts of the human body or organs”. However, it is one of the most widely used in ophthalmology, a separate sub-branch of medicine.

So, we can conclude that the classification of medical English terminology has its own relativity. The use of the word depends on the situation. If the situation is domestic, then the word is commonly used; in the case of medical research, the word acquires all the qualities of a narrow-field or at least an interdisciplinary term.

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PHILOSOPHICAL UNDERSTANDING OF TRUTH. IS IT POSSIBLE TO RETURN TO THE ORIGINS OF WESTERN EUROPEAN THOUGHT?

Philosophy was born as a thought that tries to cognise the objective reality of the ideal world and the boundary levels of abstraction of the sensual world.

Having freed itself from religious and mythological consciousness, philosophy stepped into the space of metaphysics and began to look for its own path and methodology for development. The difficulty of the task, to this day, is that the capabilities of the human mind are limited, so it is impossible to study problems of the metaphysical level using strictly rational scientific methods. Intuition, insight, imagination, revelation, faith, meditative and prayer practices, even magic, although known to science, do not belong to the acceptable scientific arsenal of cognitive methods. Intuition, insight, imagination, and faith deserve special attention from the list, but their understanding in scientific knowledge remains problematic.

The original attitude and purpose of philosophy was proclaimed as the search for Truth (with a capital letter). That is, the Absolute Truth, by which religious systems understand the Divine Essence. That is, the goal of philosophical and religious search was the same. And just like religion, the initial and then the medieval stages of philosophy's development presupposed a special way of life for the philosopher that bordered on spiritual practice.

It is difficult to make an exhaustive definition of metaphysics. First of all, the space of metaphysics is the transcendental world and knowledge about it. Therefore, the ideas of the Good, the Beautiful, the One, and the Logos, which were identified with the Truth, become the research space of ancient philosophers.

Influential ancient and medieval philosophical concepts were mostly idealistic. Gradually, however, philosophical reflection became more rationalistic, society lost faith in the Church, and the latter lost its authority.

The medieval philosophical discussions about the duality of truth and its distinction in philosophy and religion, which lasted for almost a millennium, despite Thomas Aquinas' attempt to develop the concept of a single truth, led to the fact that the philosophical, and later scientific and philosophical direction of the search for truth, lost its metaphysical nature. The metaphysical Truth was recognised as

inaccessible to rational cognition, and philosophy followed the path of cognition, which implies that its result is knowledge expressed in conceptual form.

In the Renaissance, new philosophical trends (empiricism and rationalism) quickly gained leading positions in Western European thought. The New time, marked by social upheavals in European life, led to a sharp change in public attitudes towards everything related to metaphysics, mainly due to a negative attitude towards religion. The society as a whole at that time was fascinated by materialistic and rationalistic ideas, which were fuelled by advances in basic and applied science, which in turn led to scientific and technological progress and rapid changes in the quality of life.

In Western European philosophy, this resulted in the fact that questions of knowledge began to revolve mainly around natural science problems. The field of philosophical cognition became purely rationalistic, dominated by methods that use the reasoning and logical matrix of the mind, and evolved into epistemology. Metaphysics took the place of the "classics".

The philosophies of Nietzsche, Schopenhauer, Schelling, Kierkegaard, Jacobi, Dilthey, Spengler, Bergson, and later existentialism and personalism became an interesting, vivid, sometimes even extravagant phenomenon that, given the epithets, can even be defined as a special literary genre. All these thinkers felt the importance of the irrational component in the search for Truth, and Kant was right to argue that metaphysics cannot be a science.

So, what does the modern theory of truth tell us about Truth? Starting with Aristotle, it gradually focused on rationalistic knowledge, methods of achieving it, its verification and criteria of truth. Humanitarian knowledge also strives for scientificity and scientific status, but, for obvious reasons, remains in an intermediate position. The issue of truth in modern sciences remains relevant, but raises many questions. Each branch of scientific knowledge tries to interpret it in its own way. And this is far from the ancient and medieval Truth.

The ancient Greek philosophers are still an inspiration to their followers precisely because of the depth of the questions they asked. Questions about the existence and search for Truth, God, and the spiritual perfection of man arise quite naturally for those who think on a metaphysical level. The paths to such perfection may differ, but hardly anyone can deny that a lofty goal always fills life with deep meaning.

Today, however, philosophical truth has become virtually identical with rationalistic scientific truth, has deviated from its ancient Ideal, and is unable to provide society and individuals with spiritual and moral guidance for existence in today's unstable world. The gradual advancement of Western civilisation towards an increasingly developed consumer society has, in addition to obviously positive consequences, an apocalyptic component of growing social problems. The spiritual, ethical and value orientation of a critical number of people in today's most influential societies is not a priority. Utilitarianism, as an everyday philosophy of life of the majority (consciously or not), has led to a shocking contradiction when a highly developed civilisation in the material sense, which, thanks to the scientific and intellectual activity of man, has all the possibilities to create a decent life for all inhabitants of the planet, is on the verge of self-destruction, and the same collective mind, within the framework of traditional secular thinking, cannot find a generally acceptable solution to overcome the global crisis and build a working model of peaceful life on the planet.

Perhaps we need to go back to the origins and find the guidelines leading to the Truth there? Perhaps scientific truth is only reliable utilitarian knowledge (of course, important and necessary, but priorities need to be set), the search for which ultimately leads its zealous minister to Faustian despair? Perhaps existential questions are more important?

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SPACE LAW AND ITS FUTURE PROSPECTS

Nowadays, the evolving landscape of space law and its prospective developments have become the issue of primary importance. As humanity ventures further into the future, an increasing number of inquiries arise regarding the governance of space activities and the determination of who should be the one to decide on what should

be allowed. Furthermore, the important matter of ownership in space further intensifies the complexities surrounding this topic.

As then space advances, it becomes crucial to establish a comprehensive set of rules and legal frameworks to govern human activities in space. This guarantees a systematic and just approach to resolving potential disputes, promoting civil means of addressing conflicts that may arise in the course of space endeavors [1].

The multifaceted nature of these challenges demand ongoing legal considerations to accommodate the expanding scope of space exploration. Addressing questions of ownership and defining the parameters of acceptable conduct in space activities require a nuanced and adaptive legal framework. It is within this context that existing international treaties play a crucial role, providing foundational principles and guidelines to address specific issues that have emerged over the course of space exploration.

As we progress into the future, the continual development and refinement of space law are essential to meet the evolving needs and complexities associated with space activities. Collaborative international efforts are imperative to enhance and expand legal mechanisms that govern our endeavors beyond Earth.

These are the main points that have to be covered by future law systems in space:

- **Resource Exploitation:** With the potential for mining asteroids or extracting resources from celestial bodies, space law will need to address property rights and ownership of extracted resources.

- **Private Space Companies:** The roles and responsibilities of private space companies in activities such as satellite deployment, space tourism, and space habitats need clear legal frameworks.

International Collaboration:

- **Global Governance:** Strengthening international collaboration and developing treaties or agreements to govern space activities to avoid conflicts and promote peaceful use of outer space.

- **Space Situational Awareness (SSA):** Establishing mechanisms for sharing information about space objects and their trajectories among space-faring nations.

Cybersecurity in Space.

- **Space-based Assets Security:** Addressing cybersecurity concerns related to satellites, space-based infrastructure, and communication systems to prevent unauthorized access and attacks.

Military Activities in Space:

- Arms Control: Establishing agreements to prevent the weaponization of space and regulate military activities to ensure the peaceful use of outer space.

Colonization Laws:

- Establishing legal frameworks for human settlements on celestial bodies, including property rights, governance structures, and self-sustainability requirements.

Space Governance and Regulatory Frameworks.

- National Legislation: Nations developing and updating their national space laws to align with international agreements and address new challenges posed by advancing space activities.

- Ownership of Celestial Bodies: As earlier been said The OST, explicitly states that celestial bodies, including the Moon and other celestial bodies, are not subject to national appropriation by any means. And according to this treaty we should consider that even in nearest future no state will be able to occupy and claim ownership over any celestial body. In my opinion this is one of the most important points on which further development of international space law should be based on [2].

As it is well-known, The Moon Agreement, was signed in 1979, expands on the OST by explicitly stating that the Moon and its resources are the common heritage of all humankind. It prohibits any national appropriation of lunar resources and emphasizes international cooperation in lunar exploration. There is still a lot of work to do since the major players did not undertake this agreement which means that their future lunar exploration is still not bended.

Undoubtedly, legal frameworks need to be developed to address property rights and ownership of extracted resources. Currently, there is no widely accepted international agreement on this matter.

NASA future perspectives in the context on international space law.

While NASA's primary focus is on space exploration, research, and technology development, its activities and collaborations contribute to the broader context of space law. The agency's commitment to international cooperation, adherence to legal principles, and engagement in discussions about emerging space-related issues all influence the development and evolution of space law.

Nevertheless, this are the main future perspectives of NASA in the context on international space law.

International Collaboration:

NASA has a history of collaborating with international partners on various space missions. Future perspectives may include strengthening these collaborations, potentially involving partnerships in lunar and Martian exploration, as well as joint scientific endeavors.

Space Policy and Advocacy:

NASA's future perspectives will also be influenced by broader geopolitical and policy considerations. Changes in administrations may lead to adjustments in space policy, budgets, and priorities.

Space Resource Utilization:

The issue of space resource utilization, particularly on celestial bodies like the Moon and asteroids, is likely to become a focal point in international space law. NASA may contribute to discussions on developing legal frameworks for the extraction and use of space resources in a manner that is equitable and sustainable [3].

Global Space Governance:

NASA's involvement in discussions related to global space governance may increase. The agency could contribute to shaping international agreements and mechanisms that address common challenges, promote transparency, and prevent conflicts in outer space.

It's important to note that the evolution of international space law is a dynamic process involving input from various space-travelling nations and entities. NASA's future perspectives in this realm will depend on its mission objectives, international collaborations, and the broader developments in the space community.

As space activities continue to evolve, there is an ongoing need to develop and refine space legislations to address emerging challenges. International cooperation remains essential to establish clear guidelines for ownership and responsible use of space resources. Additionally, addressing gaps in existing space law, especially concerning resource exploitation and property rights, will be crucial for the future of space activities.

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BELIEF AND INTENTIONALITY

Belief is widely held in contemporary analytic philosophy to be involuntary. It is claimed that we have no real control over our beliefs as we cannot decide to believe something beforehand and start believing it afterwards. When deciding to believe the sky is blue, some argue, we must already have the content of that belief in mind, which refutes the initial intention of deciding to come into the belief at some later stage. This conception, as this author argues, is mistaken, for it deprives humans of the ability for epistemic agency, contradicting the empirically evident human ability to act as innovative agents in their lifeworld. This article outlines in brief format an argument supporting the ability to engage actively in belief formation.

Franz Brentano re-introduced the term ‘intentionality’ to bear on issues of mental phenomena. It was a technical term used by Scholastic philosophers in the Middle Ages to refer to what is before the mind in thought. It is not to be confused with the word ‘intention’ commonly used in English to refer to somebody’s planned action. Intentionality in Brentano’s sense is the ‘aboutness’ or the directedness of mental states. When hearing a sound, for example, the mental state of ‘hearing’ is directed toward a presentation of that sound to the mind. Brentano argued that intentionality is a distinct marker of the mental, that ‘mental’ is indeed co-extensive with intentionality. He also advanced the thesis that intentionality is necessarily phenomenal; all intentional states involve a consciousness of the “what it is like to be in that state” type – a prevalent characterisation of phenomenal consciousness, the latter which resists physicalist reduction.

Roderick Chisholm introduced Brentano’s work into the Anglophone sphere of philosophy in the 1950’s. Unfortunately, the phenomenal characterisation of intentionality was lost in work on intentionality in the following decades [2]. Consequently, it has become standard practice to distinguish between two types of intentionality: phenomenal intentionality, pertaining to sense experience and states such as pain, pleasure, etc., and cognitive intentionality, reserved for propositional attitudes such as beliefs, hopes, and wishes. The intentionality of propositional attitudes is assumed to be fully exhausted by their propositional content, i.e., what they are about. For example, the belief “the president is in Paris” is

intentional solely by virtue of the content of the belief – the proposition “the president is in Paris” [3].

In recent years, renewed interest in a central idea of Brentano’s work, that phenomenal intentionality is the only kind of intentionality there is, has begun to find favour with some contemporary philosophers [1]. However, this author contends that lumping all mental states together as being phenomenally intentional lies at the heart of the problematic notion that belief is involuntary. It can be explained as follows: if all mental states are phenomenally intentional, then so are propositional attitudes, implying there is a specific sense of “what it is like” to have a certain belief. There is a perhaps implicit assumption that if all intentionality is phenomenal, all features of paradigmatic phenomenal states must be shared by all other types of intentional mental states. An important feature of perceptual mental states is that, while awake and conscious, such states occur spontaneously in the mind. Paradigmatic perceptual mental states such as the awareness of colours or patches of colour are phenomenal states whose occurrence in the mind we have no control over. They are also intentional in Brentano’s sense by virtue of the subject directing mental awareness toward them. But these mental phenomena and their concomitant intentionality do not constitute beliefs. Only by conflating belief states with such phenomenal mental states does the notion arise that beliefs are ipso facto involuntary. Not many contemporary philosophers are convinced that all intentionality is phenomenal. However, the widespread notion that belief is involuntary indicates that even among those who are not, many succumb, perhaps unintentionally, to transposing the involuntariness of phenomenal perceptual states onto propositional belief states.

This author argues that there is an intermediate stage between the occurrence of a phenomenal state and the appearance of a belief state. This intermediate phase constitutes active, voluntarily controlled belief formation on the part of the subject. The key premise of the argument trades on the notion of intentionality in the everyday sense of the word as the commitment someone may have to follow a certain planned course of action, in relation to Brentano’s sense of intentionality. A typographical distinction will be made here between intentionality in the everyday sense and INTENTIONALITY in Brentano’s sense. The key premise of the argument holds that, in the case of belief, INTENTIONALITY is determined exclusively by intentionality. Some examples will help to explain. Looking out the window on

a summer's day, I have a multitude of sense impressions; the blue colour of the sky, the green leaves of trees, the sounds of birds chirping, etc. It is not uncommon for philosophers to say things such as that, under these circumstances, the belief that the sky is blue "pops into my head". But there must certainly be more to it than that. One can perform a small experiment and observe when, without intentionally thinking of anything and just mentally 'observing' the stream of consciousness in the mind, whether any fragment of that stream actually appears in the form of a linguistically well-formed phrase such as, for example, "I believe that the desk is brown", or "the desk is brown", for if it does, it means that one is intentionally thinking a thought that is about the desk and its colour. What can be concluded from this simple example? Crucially, that when forming a belief, one selects from one's field of perceptual awareness, which might contain all sorts of objects such as books, a lamp, a wall, pictures, along with a multitude of colours and shapes, the desk, and its colour. It is certainly a random selection, but the important point is that it is a selection nevertheless. One has consciously and intentionally chosen to select the desk and its colour, as well as to join the colour to the desk as a property thereof. All of this amounts to intentional mental effort, with the intentionality embodied by one's decision what to select in terms of objects, properties, and relationships.

The question may be asked, what is the intention behind forming the belief "the desk is brown" if one has no intention of employing this belief in any further course of action? This issue is important in illustrating that intentionality in belief formation is not constituted by any physical action that may result. The intentional aspect is fully defined by the belief, the selection of its components, and its deliberately planned syntactical structure. The intention behind forming the belief "the desk is brown" *is* forming a belief about the desk, its colour, and the relationship between the two items. This intention subsequently gives rise to a belief of which the INTENTION, i.e. what the belief is about, is a brown desk.

Whether the INTENTIONALITY of belief is phenomenal is a different question. In one sense, a belief such as "the desk is brown" is a judgement in the traditional conception of judgment as predication of a property [4], and judgments form one of the three basic classes of phenomenally intentional mental states in Brentano's philosophy. Brentano uses judgement in a different sense [4], however, let us assume for the purpose of this argument that all beliefs are judgments in Brentano's sense. All beliefs would then be phenomenally intentional. It was

claimed earlier that if all mental states are phenomenally intentional, then belief tends to be viewed as involuntary. Will this not contradict the thesis that belief formation involves intentional mental action? Recall that the notion that belief is involuntary rests upon conflating sense phenomenal states with belief states and ascribing all features of sense phenomena to all intentional mental states. By removing this conflation, the apparent contradiction disappears, however, arguing independently against the conception that phenomenal states are identical with phenomenal beliefs will be a prerequisite.

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IMPACT OF ANXIOUS-AMBIVALENT ATTACHMENT TYPE ON PSYCHOLOGICAL WELL-BEING IN ADOLESCENTS

Bowlby-Ainsworth Attachment theory has gained much scientific and social interest in the last few decades, just as much as how different attachment types defined by this theory affect psychological well-being. While directly the theory does not imply that insecure attachment styles impair psychological well-being, a number of studies confirm that neglecting children's emotional needs has harmful consequences in adolescence. The most damaging type in classical (ABC) classification is anxious-ambivalent.

An ambivalent attachment style involves a combination of the desire for emotional closeness with an attachment figure and its avoidance. Usually, it results from parents satisfying children's needs with neglect of such [2].

Separation from parents and transition to relationship with peers as a dominant source of emotional closeness form a sensitive critical period in adolescents' lives.

Excessive affection towards family, which is common to the ambivalent type, can become a reason for ridicule amongst teenagers. This furthers the anxiety adolescents already experience due to their insecure attachment with relatives: they are constantly hesitating between the longing to preserve safety in relationships at home and joining a new social group. This is one of many problems caused by anxious-ambivalent attachment type, which create a decrease in emotional wellness in adolescents.

According to Riff's six-factor model [6], psychological well-being includes self-acceptance, the establishment of quality ties to other, a sense of autonomy in thought and action, the ability to manage complex environments to suit personal needs and values, the pursuit of meaningful goals and a sense of purpose in life, sustainable development of a person. If one or more of these aspects are in deficit, a sense of happiness and satisfaction with life worsens. Since ambivalent attachment type involves a negative internal working model of self and a positive internal working model of others [1], which make them overly dependent on other people, the main issue concerns self-acceptance. Research shows that adolescents with an ambivalent type rate their intellectual and physical abilities lower compared to respondents with other attachment types and have significantly worse body image, compared to secure type [3]. Apart from that they have higher level of anxiety and depressive symptoms [5] and lower level of self-esteem [7].

Another effect is decreased level of self-efficacy and weaker mechanisms engaged in coping with stress [4] affecting such important components of psychological well-being as a sense of personal growth and control over environment. One of consequences is tendency to risky behaviors connected to drug use [3], which undoubtedly worsens psychological well-being generally.

To sum up, the analysis of different types of attachment defined by Bowlby-Ainsworth theory helps in the development of psychotherapeutic methods to improve the psychological well-being of adolescents. The issues that have been highlighted need to be further investigated.

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AXIOLOGICAL TECHNOLOGY OF PUBLIC DIPLOMACY IN UKRAINE DURING THE FULL-SCALE RUSSIAN-UKRAINIAN WAR

Currently, we are observing significant changes in global politics and the structure of international relations. In an era where information, as well as misinformation, spreads at an unprecedented speed, the very essence of diplomacy is undergoing transformation, dealing with a broader spectrum of various forces.

It can be argued that the tasks of diplomacy have become noticeably more complex, because today, it is insufficient to consider only its political, economic, or demographic characteristics to form the perception of any country. One of the most crucial aspects of the overall assessment of a state is the impression it makes on the global stage.

It should be noted that public diplomacy has assumed an increasingly active role in recent years. Regarding the origin of the term "public diplomacy" it was first introduced in 1965 by E. Gullion, the dean of the Fletcher School of Law and Diplomacy, to denote the process of achieving foreign policy goals by subjects of international relations through influencing foreign public opinion [3, p. 35].

E. Gullion initially viewed public diplomacy as synonymous with the term "propaganda." However, if the concept "propaganda" has a negative connotation in English, then the introduction of the concept "public diplomacy" by the American

scholar gives it a more neutral. On an official level, this term was first used during a session of the U.S. Congress in 1977 in a report by the Murphy Commission on the foreign policy organization apparatus [2, p. 57].

Currently, both scientific and practical interest in this field is noticeable. This is unsurprising, considering that governments worldwide have to navigate a 24-hour news cycle and realize that the information they convey is constantly under the scrutiny of an international audience. As a result, public diplomacy is gaining an increasingly prominent political role, extending beyond mere slogans and other mass communication tools that have long been associated with propaganda or public relations.

It is essential to highlight another component of public diplomacy, namely cultural diplomacy. In translation, it means "культурний вимір дипломатії" or the "cultural dimension of diplomacy." It refers to a system of actions by governmental and non-governmental actors aimed at achieving specific foreign policy objectives by utilizing cultural mechanisms [6, p. 110]. This is implemented in practice through the organization of conferences, exhibitions, festivals, thematic weeks dedicated to national culture, literature, cinema, and more. By spreading and popularizing culture, science, education, literature, and language abroad, it is to achieve much more significant results than through threats, intimidation, and bribery [5].

The next direction of public diplomacy is digital diplomacy. Its emergence has become possible due to the dynamic development of information and communication technologies, effectively erasing national boundaries and enabling global influence on all aspects of the society of a particular state. Based on this, digital diplomacy can be interpreted as the use of the social networks and internet capabilities in government diplomatic practice to support state institutions on foreign policy issues, including mechanisms to influence foreign audiences [1, p. 663].

Thus, public diplomacy is a comprehensive concept that denotes the activities of various actors, both governmental and non-governmental, aimed at explaining a country's foreign policy to foreign audiences and encouraging foreign states to adopt foreign policy decisions that are favorable to these actors. In other words, public diplomacy is a system of dialogue with foreign publics [4, p. 115].

In the context mentioned above, the axiological technology of public diplomacy becomes extremely relevant during the full-scale Russian-Ukrainian war.

Public diplomacy as a technology of Ukraine's foreign policy reached a new level only with the military aggression of Russia, which posed a global challenge to

our country. The military actions in the East significantly destabilized financial and diplomatic relations with European states.

On February 14, 2022, during a bilateral meeting, the Ukrainian side expressed interest in fruitful cooperation in the defense sector with representatives of the United Arab Emirates. A significant step in the development of Ukraine's public policy was the involvement of leaders from European countries who have a positive attitude towards Ukraine.

Thus, public diplomacy opens up broad opportunities for collaboration and achieving the country's foreign policy goals. The full-scale invasion of Russian aggressors into Ukraine caused numerous challenges to the country field, including in the realm of public diplomacy. It became evident that there is a low level of awareness about Ukraine in the world, and a stable image of the country abroad is lacking. Representatives of the Ministry of Foreign Affairs, Ukrainian diplomatic missions abroad, as well as state and non-state entities and opinion leaders capable of enhancing the country's image, should be involved in this effort.

At the current stage, the main directions of development for public diplomacy in Ukraine should include cultural, economic, scientific-educational, sports, and digital diplomacy. Each of these areas requires the functioning of effective competent groups responsible for enhancing Ukraine's image and countering Russian aggression.

In cultural diplomacy, it is extremely important to actively use cultural events such as festivals, exhibitions, and concerts to draw attention to the richness and diversity of Ukrainian culture. Economic diplomacy involves developing international economic ties and attracting foreign investments. Scientific-educational diplomacy requires active collaboration with universities and research institutions abroad, fostering student and researcher exchanges.

Sports diplomacy can leverage sporting events to enhance international recognition and shape a positive image. Digital diplomacy, on the other hand, involves the effective use of digital tools and technologies to communicate Ukraine's narrative, counter disinformation, and engage with a global audience.

In order to solve the significant challenges facing Ukraine today, it is essential to deepen international cooperation in economic, scientific, educational, and cultural spheres with the assistance of opinion leaders, volunteers, and activists. Each of these diplomatic avenues plays a crucial role in building positive international perceptions of Ukraine and countering the multifaceted challenges posed by Russian aggression.

In conclusion, it is worth noting that public diplomacy is an integral component of Ukraine's foreign policy, especially in the context of the modern world. After all, today international relations becoming more complex and competitive, public diplomacy is a necessary tool for achieving the country's foreign policy objectives. It allows for raising awareness of the international community about Ukraine, advancing its national interests, and gaining international support. The public diplomacy tools such as public events and social media, is crucial, and the involvement of stakeholders is necessary to enhance our country's presence on the global stage, especially during times of conflict.

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THE IMPACT OF GLOBALIZATION ON THE NATURE AND SCOPE OF CRIMINAL OFFENSES

Globalization is the process of expanding economic, legal, political, cultural, and other interactions between countries and peoples of the world. This phenomenon is becoming increasingly prominent in the 21st century due to rapid technological advancements, particularly the Internet, which allows for instant communication and information exchange around the world.

The impact of globalization on social phenomena has led to significant social changes in societies. Today, many socio-economic issues such as peace, crime, immigration, production, employment, technological development, environmental

threats, income distribution, prosperity, social unity, and identity are described as phenomena influenced by globalization. [3, p. 2]

Globalization in the field of law encompasses several factors, including the convergence of legal systems from different states, the formation of legal systems for communities, and ultimately a global legal system that is equal for all. This includes the emergence of new legal objects in the legal sphere, new types of criminal offenses and subjects that commit them, and the introduction of uniform legal terminology, recognition of certain principles, standards, and legal institutions worldwide.

The goal of this paper is to describe the impact of globalization on the nature and scope of criminal offenses as well as the emergence of new subjects of criminal offenses. It facilitates the rapid dissemination of information, technologies, goods, and services beyond national borders. Globalization affects the characteristics of the subjects of criminal offenses by bringing cultures closer, expanding international relations, and exchanging information through modern technologies. Transnational criminal activities constitute the most socially dangerous types of criminal activities, such as organized crime, illegal trafficking of arms, chemical and nuclear materials, drugs, human trafficking, money laundering, counterfeit goods, products, illegal migration, the sex industry, pornography, terrorism, and more. [1, p. 15]

Studying such transnational crimes reveals the necessity of expanding the understanding of criminal subjects in the context of globalization to enable law enforcement agencies to respond promptly and enhance legislation at international and national levels.

Global trends towards integration and globalization inevitably lead to interactions and interferences in national legal systems. As integration processes strengthen, further convergence of legal systems becomes increasingly apparent. [2, p. 228]

Although globalization processes facilitate more effective cooperation against criminal groups and criminal organizations by enhancing information exchange and coordination between countries, they also lead to the application of new technologies by law enforcement authorities. Thus, through global cooperation, preventive actions can be taken against these particular subjects of criminal offenses.

In conclusion, globalization has both positive and negative impacts on criminal doctrine. It is essential to focus on international cooperation, research on new crime structures, especially the subjects involved, and implementation of appropriate measures to counter new challenges arising from globalization.

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POLISEMY AND SYNONYMY OF MEDICAL TERMS

Both common words and terms are systemic linguistic units and their systemic status is determined by the presence of lexical meaning. Both the term and the commonly used word correlate with the concept and representation as forms of logical and figurative thinking, carry out significative and nominative functions, are system units, etc. However, unlike the semantics of a word, the semantics of a term is a complex of interacting lexical and conceptual meanings. In modern linguistics, the lexical meaning is also called the internal form or literal meaning of the term [1].

Cases when several concepts are called by one lexical unit can be qualified as polysemy. When listing the features that characterize the terms, or rather, should characterize terms, unambiguity is put on one of the first places [2]. Although this requirement is natural for terminology, since the unambiguous relationship of the signifier with the signified word provides the necessary accuracy of information in science, technology and other fields, no less often in the literature concerning terminology issues, one can find remarks about the lack of unambiguity of terms, about the polysemy of many of them.

More often nouns presented in the terminology are polysemantic. These words designate object meanings organically inherent in the categories of names.

The evidence of the ambiguous use of noun terms can be illustrated by the following example: *accident* (в повсякденному житті) – нещасний випадок,

катастрофа. *Accident* (в медицині) – ускладнення. *Box* (в побуті) – ящик. *Box* (в спорті) – вид спорту: єдиноборство – кулачний бій в спеціальних боксерських рукавичках. *Box* (в медицині) – ізолятор.

However, the polysemy of terms does not make it impossible to understand them correctly. Usually it is indicated that the term does not need context, since it should be understood without context. But this position cannot be absolutized, in terminology the context is important, since the content of a term is revealed only through its real functioning.

As for the synonymy of terms, it should be noted that the concept of synonymy in the general literary language and in terminology is sometimes understood not quite as the same phenomena. In the general everyday language, synonyms are words that do not coincide in meaning or have similar, close meanings. The reasons and sources for the emergence of synonyms (doublets) in terminology are partly common with the general literary language, and partly different from it. Common cases include cases of parallel use of anatomical terms and their equivalents in medical terminology: *abdomen* – *intestine* (черевна порожнина), *axilla* – *armpit* (пахва), *carpus* – *wrist* (зан'ястя), *coxa* – *hip joint* (тазостегновий суглоб), *cubitus* – *elbow* (ліктьовий суглоб), *patella* – *knee-cap* (колінна чашечка), *spleen* – *milt* (селезінка), *bronchus* – *airtube* (бронх), *ventricle* – *stomach* (шлунок), *malleolus* – *ankle* (кісточка), *medulla* – *spinal cord* (спинний мозок), *collar bone* – *clavicula* (ключиця), *hernia* – *rupture* (грижа), *morbilli* – *measles* (кір).

Examples of synonymy in terminology show a fairly large representation of this process in special vocabulary. Moreover, although synonymy here has its own characteristic features and its reasons for its appearance, it is in this manifestation that it is organically inherent in terminology and is widely represented both in the theoretical and practical application.

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PANEL 3
Modern Research in the Sphere of Socio-Economic Sciences
and Information Technologies
(DNU, Zoom)

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**BITCOIN HALVING AND ITS IMPACT ON THE PRICE OF BITCOIN
AND ALL CRYPTOCURRENCIES IN GENERAL**

The Bitcoin Halving is the moment when the reward for Bitcoin miners is cut in half. This happens approximately every four years, when the blockchain network completes around 210,000 additional blocks. It is caused by the standard established by the creators of the blockchain to steadily decrease the pace at which new cryptocurrency is generated.

But how does this impact the market and what could it mean for investors? If to talk about the nearest halving, it is expected in April 2024. Approximately 5.5 months prior to the halving, significant withdrawals may offer considerable post-halving returns. Typically, there's a surge in Bitcoin's value approximately 60 days before the halving, driven by investors capitalizing on the hype, with intentions to sell prior to the event itself. However, just before the halving, there's often a downturn in prices. For instance, in 2016, the decline was as deep as 38%, while in 2020, it was around 20%. This dip can lead investors to question the halving's potential impact on prices. Subsequently, there's a phase of reaccumulating which can last several months, during which many investors may feel impatient or disappointed by the lack of immediate post-halving gains. However, following this phase, Bitcoin typically enters a period of parabolic growth, rapidly ascending towards new all-time highs [1].

The patterns of price fluctuations are readily apparent when examining the historical context of previous halving and history of BTC growing in general. Bitcoin's development from 2009 to 2015 saw remarkable growth, starting from zero to hitting \$29.60 in 2011, but dropping to \$5 by year-end. 2012 saw minor

gains, while 2013 was explosive, reaching \$1,000+ in November, closing at \$732. From 2016 to 2020, Bitcoin increased steadily, hitting \$19,188 in 2017, facing fluctuations in 2018 and 2019. The COVID-19 pandemic accelerated its rise, closing 2020 at \$28,993. In 2021, it hit over \$69,000, dropping to \$40,597 by September. 2022 saw declines, hitting below \$20,000 by year-end. However, 2023 witnessed a remarkable surge, closing at \$42,258. In January 2024, Bitcoin Spot ETFs approvals spurred another rise, breaching \$70,000 in March [2].

Of course, the cryptocurrency market is not limited to Bitcoin alone; it encompasses numerous alternative cryptocurrencies, commonly referred to as "altcoins". When Bitcoin is stable, the altcoin market flourishes. When Bitcoin is bullish – people dump their alts to sell into Bitcoin/fiat. Doing this preserves the value of your account. When bitcoin is clearly taking a dirt nap – people dump their alts to lock in fiat value before their trading accounts vaporize [3].

In conclusion, The Bitcoin Halving, a pivotal event occurring approximately every four years, slashes the reward for Bitcoin miners in half, curbing the pace of new cryptocurrency introduction. The market dynamics preceding and succeeding the halving illustrate a pattern of surges, dips, reaccumulation, and eventual parabolic growth. This cycle has historically impacted Bitcoin's price trajectory significantly, with notable fluctuations reflecting market sentiment and external factors such as the COVID-19 pandemic. While Bitcoin's performance directly influences the altcoin market, where traders often seek to maximize Bitcoin gains, stability in the Bitcoin market tends to foster growth in the altcoin sector. Understanding these interconnected dynamics is crucial for investors navigating the cryptocurrency landscape.

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ACTUALIZATION AND HISTORICAL ORIGINS OF THE COUNTRIES COMPETITIVENESS AROUND THE WORLD

The search for the causes of the wealth of nations has been the driving force of economic science throughout almost its entire history. Within the framework of modern economic theory, the reasons contributing to the study of the international competitiveness of countries and its factors were considered and analyzed. Considering the increasing mutual influence and interdependence of countries occurring against the background of globalization processes, the relative positions of countries are coming to the fore, having been expressed in competitiveness ratings most clearly.

Before moving on to presenting modern approaches to the international competitiveness of countries, it is necessary to examine the origins of this concept. The theory of international competitiveness can be considered as a continuation of the principles of two sections of economic theory: theories of international trade and division of labor, as well as the theory of economic growth. This phenomenon was also directly influenced by the theory of competition, institutional and evolutionary approaches in economics.

In the early stages of the development of political economy, the main research was conducted within the framework of mercantilism, an economic doctrine of the 16th-18th centuries, emphasizing the role of international trade as a source of economic growth. Foreign trade was considered as the main source of replenishment of the treasury, being the only channel for the influx of monetary metal for most European countries. National wealth, one of the central concepts of mercantilism, was associated exclusively with the quantity of gold of a nation. According to this approach, the accumulation of gold was the main goal of the state and a means of increasing wealth. Trade policy was based on stimulating exports, often through subsidies, and reducing imports of finished goods through quotas and high duties. Among the mercantilists, there was a theory of the static nature of world resources, as a result of which the accumulation of wealth by one nation occurred at the expense of its reduction in another (trade as a “zero-sum game”), which led to a policy of aggressive exports and active protectionism [3].

Another important aspect of competitiveness, according to mercantilism, was the low cost of producing exported products due to low wages. This approach does not fully correspond to modern concepts, however, similar approaches are still used by developing countries to achieve success in global competition. However, already within the framework of mercantilism one can find the origins of modern views on the importance of the human factor.

The views of mercantilists on the competitiveness of the national economy formed the basis for further research into the reasons for the growth of national welfare, revealed the importance of foreign trade for economic development, determined the role of the state in foreign trade and described the trade balance. Further analysis of the role of foreign trade for economic growth was aimed at finding the advantages of countries over trading partners in the world market. The development of the theory moved from absolute advantages to relative ones, then to the concept of factor advantages, and from them to the competitive advantages of countries [2].

Models of international competition, built in the 18th – early 19th centuries by the founders of classical economic theory, Adam Smith and David Ricardo, are the basis for the modern understanding of these processes. In Smith's scientific works, the leading place in the regulation of production and exchange is occupied by competition, which he calls the “invisible hand” of the market. His concept gives a new look at the sources of economic growth. What comes to the fore is not the accumulation of gold (as in mercantilism), but the increase in production potential and labor productivity. The benefits of foreign trade, according to Smith, stem from the absolute advantages of countries in the production of certain goods. The country that produces a certain product with the least labor costs per unit of production has an absolute advantage, that is, it is cheaper for itself. Thus, trade turns out to be mutually beneficial due to the ability of each trading partner to purchase goods at lower costs than if they produced it themselves. To a certain extent this approach is adopted by the modern theorist of international competition, Michael Porter, who recognizes productivity as the basis of competitiveness [1].

David Ricardo significantly developed the idea of mutual benefit of free international trade, showing that trade can take place even if a certain country does not have an absolute advantage in any of the goods. The nature of production in this model is determined by comparative advantages. Countries export those goods in

the production of which local labor is used relatively efficiently, and import those products for which the costs of this labor are relatively inefficient. Trade between countries is recognized as mutually beneficial, because it expands the possibilities of national consumption, and is presented as an indirect method of production, that allows exchanging exports for imported goods, which would be produced at high costs without trade [3].

David Ricardo's model occupies an important place in the modern analysis of foreign trade relations, but it has a number of shortcomings. For example, foreign scientists Maurice Obstfeld and Paul Krugman note a number of factors that Ricardo's model does not take into account: the practical effect of trade on the distribution of income within the country (it is assumed that the countries that participate in trade will fully benefit), differences in the resource potential of countries as reasons for trade between them and economy of scale production. In addition, this model assumes an extreme degree of specialization, which does not occur in practice. Despite the above-mentioned shortcomings, which were observed by theorists of the international economy of the 20th and 21st centuries, the validity of Ricardo's model which stresses that countries export goods for which they have relatively higher productivity is confirmed by a number of studies.

The concept of international competitiveness was formed, to a large extent, under the influence of the theories discussed above. Traditionally, an important place is given to international trade relations and the place of the country in the world market, although this factor has long ceased to be considered as a single factor. Technological progress, innovative component and institutional development as the basis of balanced economic growth play an increasingly important role in the assessment of national competitiveness. From a methodological point of view, the influence of the evolutionary approach (relations of subjects in conditions of uncertainty of the external environment) is perceived, as well as the focus on the long-term period and the identification of the reasons for the wealth of countries and the differences between them (dominant theories of economic growth).

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EVOLUTION OF APPROACHES TO DETERMINING THE COMPETITIVE ADVANTAGES OF COUNTRIES

In the conditions of globalization of production and capital, the competitiveness of the national economy is of particular importance. Firstly, it is necessary to emphasize the interdependence of the economies of almost all countries around the world. Many foreign economic barriers between domestic and foreign markets are abolished. In this regard, the world market turns into a single field of competition, and only a country that is able to ensure high competitiveness of its products can occupy a worthy place on it. Secondly, an important factor in the strengthening of competition under the conditions of globalization is the acceleration of the international movement of capital, the development of the activities of transnational corporations. Thirdly, the number of countries actually participating in global competition has increased. At the beginning of the post-war period, the USA, European countries and Japan were the traditional suppliers of industrial products to the world market. Later, new industrialized states joined them. Today, such giants in terms of population as China, India and other Asian countries, as well as the most developed regions of Latin America, have entered the world market.

Thus, national competitiveness is extremely important for any economy. Today, in the conditions of intensifying competition in most countries of the world, great importance is attached to the problem of increasing the competitiveness of the national economy. This problem is especially relevant for countries that, as a rule, export less competitive products and import more expensive products [2].

The concept of competitiveness has its own specificity. In the hierarchy of concepts of competitiveness, the basic concept is the "product competitiveness", which can be considered for its various types. Enterprises, industries, regions, and states that compete for consumers, markets, production factors, and investments act

as producers of products. Summarizing the definitions formulated by the Organization for Economic Cooperation and Development (OECD), as well as domestic and foreign authors, we can conclude that the competitiveness of the national economy is the ability of the country and its business entities to produce and sell their goods and services on world markets, ensuring high labor productivity, efficient use of resources, increased profitability of assets, expanded reproduction, a consistently high (compared to other countries) level of gross accumulation, income and wages of its citizens per capita.

By the middle of the 20th century, general theoretical ideas about the essence of competition, its main driving forces and basic classical models were formed. Methodological approaches to the analysis of competitive advantages of different countries have been developed in foreign economic science since the second half of the 20th century and evolved from the initial matrix approach in the 1960s, the factor approach in the 1970s and 80s, and the index approach in the 1990s to the modern approach, the essence of which is the use of empirical methods in assessing the significance of competitiveness factors and selecting appropriate indicators .

An attempt to identify competitive advantages and quantify the level of competitiveness was made as early as 1965 by American scientists R. Farmer and B. Richman [1]. In general, their hypothesis was that enterprise efficiency is a function of managerial efficiency, and macroeconomic efficiency is a function of the efficiency of individual economic units. Environmental factors with appropriate weight were allocated into four groups of determinants of competitiveness, called "independent variables":

- education that reflects the level of literacy, the state and quality of the educational system;
- socio-cultural characteristics demonstrating human norms, values and beliefs;
- political and legal system;
- economic – many factors characterizing the level of economic activity of the country and the state of the supporting infrastructure.

Each of these determinants was aligned with the planning, marketing, and production functions. With the help of the construction of the matrix, comparisons of various factors of the external environment, indicators of the gross national product (GNP) per capita and its growth rates were made. As a part of the so-called

comparative management, definite conclusions were made regarding the effectiveness of management systems in different countries. Research conducted by R. Farmer and B. Richman was the first attempt to determine the international competitiveness of countries, however, the matrix method was not widely used due to its too high complexity. This fact prompted economists to look for more accessible methods of determining international competitiveness, which led to the factor approach.

The most famous concept of competitiveness is the theory of Michael Porter, within the framework of which the widely known "diamond" model of the "competitive rhombus" was developed, that reflects the scheme of national competitive advantages and their interaction. The country's competitiveness factors are combined into four groups of determinants of national competitiveness:

1) factor conditions:

- material (natural) resources;
- human resources (workforce);
- financial resources (capital);
- information resources;
- infrastructure;
- quality of life;

2) conditions of domestic demand: volume, quality and compliance with trends in demand development in the world market;

3) related (family) and service industries: areas of receipt and use of raw materials, semi-finished products, equipment, use of technologies;

4) strategy and structure of firms and rivalry between firms: goals, strategies, methods of organization, management of firms, intra-industry competition [3].

In addition to the four determinants of competitiveness, two additional variables are defined in the model: random events (the probability of phenomena beyond the control of the firm) and government policy, which can either strengthen or weaken the synergistic effect of the interaction of the above-mentioned determinants and thereby significantly adjust the situation in the country.

Another important aspect of a country's competitiveness, along with the determinants, is comparative advantage, or the country's relative competitive position in a group of countries at the same stage of economic development. This aspect of competitiveness is revealed by M. Porter in the model of stages of economic development (stage model), according to which the renewal of the national economy

occurs with the help of movement towards more complex sources of competitive advantages and a relative competitive position characterized by higher productivity. M. Porter considered four stages of the development of the economy and competition, (controlled moving):

- factor-driven stage;
- investment-driven stage;
- innovation-driven stage;
- wealth-driven stage.

At the first three stages, there is a successive increase in the country's competitive advantages and, as a rule, economic prosperity, which gradually increases, and the fourth stage ultimately leads to a decrease in welfare. According to M. Porter, all developing economies usually go through the first three stages of development. At the first stage, the victory in competition is determined by the amount of production costs, at the second stage, competition is based on increasing the technical efficiency of production, and at the third stage, the creation of new goods and services becomes key.

The presence of three stages of development is also the basis of the theory of competitiveness proposed by the World Economic Forum (WEF). The factor stage is applied to countries with the lowest level of development, for which the mobilization of the main production factors (land, raw materials and unskilled labor) is the main condition for macroeconomic growth.

The investment stage refers to countries with the status of average profitability, where growth depends on investment and competitiveness is achieved through the use of world technologies in domestic production. Foreign direct investment, joint ventures and outsourcing enable integration of the national economy into the global production system. At this stage, in order to increase the attractiveness of the government, particular attention must be paid to the physical infrastructure (ports, telecommunications, roads) and the legal framework (customs, taxes, corporate law) to allow a more complete integration of the economy into global markets.

The innovation stage refers to countries with a high level of economic development that have made the transition from a technology-importing economy to a technology-creating economy. In this case, there is a critical connection between

competitiveness and a high level of education (especially in the field of exact and natural sciences), the ability to move to new technologies quickly. This transition, however, is considered the most difficult because innovation-based development requires direct state involvement in encouraging high rates of innovation through investment (both private and public) in research and development, higher education, and improving capital markets and the legal framework of all, which supports the opening of new high-tech enterprises.

Modern world economic science has revealed shortcomings in approaches to the assessment of competitiveness by international organizations, which prompted the latter to make changes to the methodology of assessing competitiveness in accordance with the latest achievements of economic theory and the results of applied research. Thus, in the report of the World Economic Forum in 2011-2012, the concept of sustainable development was taken into account for the first time and a new indicator was calculated – the Sustainable Competitiveness Index (SCI). Sustainable competitiveness is defined as the set of institutions, policies and factors that determine the level of productivity in a country, while ensuring that future generations can meet their own needs. The study of the latest concepts in the field of sustainable development led the authors of the report to the conclusion that, despite a fairly large number of studies conducted in this field, there is no established position in the economic literature on the ratio between productivity, which is the basis of competitiveness, and sustainability, while the **intrrelationship** between them is of crucial importance.

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RELEVANCE OF DOMESTIC GOVERNMENT LOAN BONDS IN TODAY'S CONDITIONS

Domestic state loan bonds (DSLБ) are securities that Ukraine issues on the domestic stock market. These bonds certify the obligation of Ukraine to return the nominal value of these bonds to their owners, together with the payment of income in accordance with the terms of their placement [1].

As of December 2023, the total amount of DSLБ in circulation is UAH 1,570,021.74 million (Table 1). The National Bank of Ukraine (NBU) and banks have the largest share of government bonds – 44% and 41%, respectively [2].

Table 1. Amounts of DSLБ bonds in circulation, million UAH

Date	Belongs to	Total	Nominated in		
			UAH	USD	EUR
22.12.2023	NBU	689989,89	689989,89	0,00	0,00
	Banks	641733,42	563335,10	44758,55	33639,77
	Legal entities	138058,39	108275,56	27320,25	2462,59
	Physical persons	53606,31	25559,17	26242,10	1805,05
	Non – residents	44609,21	43534,87	1070,22	4,13
	Total	1570021,74	1432719,09	99391,12	37911,52

During the war, domestic government loan bonds can play a significant role in the country's economy:

1. Funding for war: T-bills can be used as a means of raising funds for the government in times of war. These bonds allow the government to raise capital from its own citizens to support military spending, purchase weapons, and finance defense operations.

2. Economic Stability: War can cause significant economic problems, including increased government spending and strain on resources. Issuance of DSLБ can help stabilize the economy by providing a source of financing.

3. Public debt management: War can lead to an increase in the level of public debt. However, by issuing domestic government debt bonds, the government can diversify its sources of borrowing and potentially reduce dependence on foreign debt.

4. Government budget financing: Bonds are a tool used by the government to raise financing for current and capital expenditures. The sale of bonds allows

the government to obtain the necessary money for the implementation of social programs and the implementation of other projects.

5. Development of the financial market: Issuance of bonds contributes to the development of the domestic securities market, including the bond market [3]. This is the development of the loan market, which increases the availability of loans for enterprises and individuals, which contributes to the economic growth of the country.

Therefore, domestic government loan bonds play an important role in ensuring the financing of the country, developing the financial market and attracting investments.

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FACTORS AFFECTING THE LEVEL OF ECONOMIC FREEDOM IN UKRAINE AND WAYS OF ITS INCREASE

Economic freedom is an important indicator of the development of any country. It gives people the opportunity to manage their resources, to be engaged in entrepreneurial activities and freely choose their field of activity.

According to the Heritage Foundation, in 2023 Ukraine took the 130th place out of 177 countries in the economic freedom rating. This indicates that the level of economic freedom in Ukraine is quite low [1].

Why did this situation arise? Let's consider some factors that negatively affect the level of economic freedom of Ukraine:

1. Corruption is one of the biggest problems in Ukraine. It restrains the development of business and the inflow of foreign investments. According to Transparency International, in 2022 Ukraine took 122nd place out of 180 countries in the Corruption Perceptions Index. Corruption in Ukraine manifests itself in various forms, such as: bribery, extortion, misappropriation of funds, nepotism, etc. [2].

2. The instability of the political situation. Political instability also negatively affects the economic development of Ukraine. Frequent government and policy changes create uncertainty for businesses and investors. The war with **Russia** significantly increased political instability in Ukraine.

3. Insufficient level of infrastructure development. The lack **of roads** of a high quality, electricity and other resources makes it difficult to do business in Ukraine. According to the World Bank, in 2022 Ukraine ranked 64th out of 190 countries according to the logistics index. Imperfect transport infrastructure increases costs for business and reduces its competitiveness [3].

4. War with Russia. The war with **Russia** significantly worsened the economic situation in Ukraine. It led to the destruction of infrastructure, reduced production, increased unemployment and inflation. The war also created additional enormous risks for investment and doing business.

5. Bureaucracy. Complex and bureaucratized procedures for business registration and obtaining permits complicate doing business in Ukraine.

6. Insufficient level of property rights protection. An imperfect justice system and a high level of corruption create risks for business owners.

Undoubtedly, the government of Ukraine takes a lot of measures to improve economic freedom, namely: the fight against corruption – the National Anti-Corruption Bureau of Ukraine was established in 2014; improvement of the investment climate – in 2014, the law "On state support of investment projects with significant investments" was adopted; Reform of the judicial system – in 2016, the reform of the judicial system was launched.

However, much more needs to be done to improve the level of economic freedom in Ukraine. For example, we can strengthen the fight against corruption – it is necessary to eradicate corruption at all levels of government; ensure political stability – it is necessary to carry out reforms that will ensure the stability of the political system; improve infrastructure – it is necessary to invest in infrastructure development to make Ukraine more competitive; finish the war with **Russia** – ending the war with Russia is a key factor in improving the economic situation in Ukraine.

Improvement of the level of economic freedom in Ukraine will lead to the growth of the national economy, the creation of new jobs, an increase of the well-being of

the population. All the above-mentioned will strengthen competitiveness of Ukraine on the world markets and will show the competitive advantages of our country.

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THE IMPORTANCE OF LOGISTICS IN MODERN BUSINESS

Logistics plays a crucial role in modern business and has a significant impact on various industries. It encompasses the management of the flow of goods, information, and resources between the point of origin and the point of consumption [1]. Logistics is important because it creates value for customers, suppliers of the firm, and value for the firm's stakeholders. Value in logistics is expressed in terms of time and place. Products and services have little or no value unless they are in the possession of customers when (time) and where (place) they wish to consume them. To many firms throughout the world, logistics has become an increasingly important value-adding process for a number of reasons [2, p.118].

Logistics management has **threemain** functions. The first primary function is the “operational function resulting from the need to coordinate the orders processes, transport and stockpiling, while minimising logistic operating costs” [3, p. 1057]. The aim of coordinating the ordering process is to ensure that a product is available at given time and of the desired size. Another management function is the marketing function. This helps to determine the amount of products moving in the logistics chain. The main function of marketing activities when it comes to logistics is to consider the size of demand for a logistics product in both physical and monetary forms.

The importance of logistics is explained by the fact that it plays a key role in ensuring the efficiency and success of the business. The reasons include:

1. Cost reduction: Logistics helps to optimize the processes of goods delivery and warehousing, which reduces the cost of logistics and the total costs of an enterprise.

2. Improving customer service: Efficient logistics helps ensure fast and reliable delivery of goods to customers, which positively affects customer satisfaction and improves the company's reputation.

3. Inventory management: Logistics allows you to effectively manage stocks of goods, avoid overloads or shortages and ensure a stable supply of products.

4. Global market: With the development of global trade, logistics is becoming increasingly important for enterprises that have a desire to expand their activities outside their own country.

Today's supply chain really is the method of connecting major business processes both within and across companies in order to create a high-performance business model that promotes competitive advantage. Logistics is becoming increasingly important as an integral part of the finished product.

There emerged different transport methods: cargo aircraft accommodating containerized and palletized freight, roll-on roll-off ferries, containerization on commercial ships with reusable containers of uniform size and shape, and specialized road vehicles which can cater to every type of commodity from pharmaceuticals to high fashion, and all points in between [4].

Logistics is vital nowadays. With its help, we get so many opportunities to grow and advance technologically, scientifically, and financially. All things considered, it would be very difficult for us to live without logistics. First of all, this would lead to a shortage of essential goods and services. Secondly, the organization of transport networks, including highways, railways, airways and shipping routes would be impossible. Without logistics, it would be difficult to move people and goods from one place to another. Therefore, logistics continues to evolve and remains an integral part of our lives and businesses.

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INVESTMENT ACTIVITY IN UKRAINE UNDER CONDITIONS OF WAR

Considering today's events, what is happening in the country, investment activity is becoming a driving component of ensuring the possibility of the country's recovery and sustainable development on the global stage. Investment activity in Ukraine includes various capital investment operations with the view of obtaining profit. This may include investing in the real sector of the economy, financial instruments, real estate, or startups.

State policy is aimed at stimulating and supporting investment attraction by defining directions and measures. The following ones are key: 1) strong natural resource potential; 2) availability of qualified labor force; 3) availability of promising industries that require investment; 4) positive changes in the development and improvement of the socio-economic basis for attracting investments [1].

Over the past 5 years, investment activity in Ukraine has decreased significantly. The main obstacles and risks of low investment activity in Ukraine at the current stage are: 1) military aggression against Ukraine, as the war significantly affected the GDP indicator, which decreased by 37% in 2022 compared to 2021; 2) labor difficulties arising as a result of changes in the composition of the labor force due to population migration, including both external and internal displacement (the unemployment rate has increased to 35–40%.); 3) rising inflation; 4) imperfection of the management of state structures and the institutional environment (low level of economic education, dependence on political decisions); 5) insufficiently developed domestic market; 6) limited availability of bank loans for the real sector of the Ukrainian economy (over the past 10-15 years, this availability has decreased to 15% of GDP); 7) weakness and insufficient productivity of the domestic stock market [1].

Investors are sensitive to political, economic and social risks and, for their own safety, believe that it would be advisable not to invest in countries where these risks are high and pose a threat to the loss of investment income and principal.

Therefore, after considering in more detail the investment activity in Ukraine during 2020-2022, we can say that the indicators have decreased significantly. In order to improve this situation in our country, it is necessary to introduce a certain

set of measures that would improve the investment climate and promote the attraction of domestic and foreign investment to in our country's economy [2].

The state regulation of investment activity in Ukraine should provide for the solution of certain tasks: 1) increase the potential for investment by enterprises; 2) improve the reputation and attractiveness of the national economy for investors; 3) optimize investment processes to achieve greater efficiency; 4) increase the inflow of foreign investment; 5) attract additional investment resources from various sources.

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EFFICIENCY OF INFLUENCE MARKETING IN MARKETING CAMPAIGNS

Influence marketing has become an integral part of the strategy for most modern marketing companies. It relies on influential figures who have significant authority and followership in social media. This form of marketing is also known as WOM-marketing, as it helps businesses attract a new audience and increase brand loyalty. This research explores the impact of influence marketing on the effectiveness of marketing campaigns using well-known advertising initiatives [4].

Analyzing the use of influence marketing in advertising, one bright example is the CeraVe advertising campaign featuring the famous actor Michael Cera during the SuperBowl broadcast. The campaign cleverly used the concept of a "self-styled character," with Michael skillfully fueling rumors that he is the founder of CeraVe – an unexpected twist that received immense support. The advertisement impressed viewers with its originality and captured interest, leading to a significant increase in brand attention and recognition. According to search data, searches for "CeraVe" and "Michael Cera" during the SuperBowl increased by 960%

and 4660%, respectively, which is an impressive indicator of effectiveness. Additionally, it is important to note that CeraVe collaborated with more than 450 influencers, achieving 6 billion impressions even before the SuperBowl, illustrating the influence of influencer engagement on product promotion. The success was evident not only in increased sales but also in enhanced brand memorability and preference, as evidenced by the results of the Australian CeraVe campaign on TikTok, which garnered over 15 million views and a 29% increase in preferences compared to competitors [1-3].

Another example of using influence marketing in advertising is Rihanna's advertising campaign during the SuperBowl, where she promoted her own brand of powder. This advertisement was also a great success, increasing sales of her products by 25%. Within a day after her performance, searches for her cosmetics brand "Fenty Beauty" grew by 833%, and her account gained 1.5 million subscribers [5].

In addition to SuperBowl commercials, influence marketing is widely used in other industries. For example, many brands collaborate with celebrities and influencers to advertise their products and services. Such partnerships attract a larger audience and boost sales.

In conclusion, it can be said that influence marketing significantly impacts the effectiveness of marketing campaigns. The use of influential figures in advertising allows brands to increase their recognition, attract new customers, and boost sales.

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DEVELOPMENT OF INFORMATION TECHNOLOGIES IN ACCOUNTING AND REPORTING AS A FACTOR OF INCREASING THE COMPETITIVENESS OF ENTERPRISES IN UKRAINE

The modern world is characterised by rapid technological development and increased competition between businesses. In this regard, it is important that enterprises have the opportunity to use the modern information technologies in accounting and reporting in order to ensure their competitiveness and success in the market.

Information technology in modern business is a prerequisite for improving the efficiency of enterprises [1].

One of the main advantages of using information technology in accounting and reporting is the speed and accuracy of information processing. As a result, companies can quickly and efficiently analyse the financial and economic information, which allows them to make the right decisions and carry out the strategic planning [2].

In addition, the use of information technology in accounting and reporting allows companies to reduce the cost of manual work and document storage. This improves the work efficiency, reduces the errors, and ensures the quick access to the necessary information.

In recent years, Ukraine has seen a significant development of information technology in accounting and reporting at enterprises. According to the National Commission for the State Regulation of Communications and Informatisation, in 2020 there were more than 26 million Internet users in Ukraine, this fact indicates a significant spread of information technology in our country [6].

According to the State Statistics Service of Ukraine, in 2020 more than 70% of enterprises used IT technologies in their activities [3].

There are several aspects to consider when introducing the latest technologies that would ensure the effective functioning of the accounting and reporting system at enterprises:

a) first of all, it is necessary to prepare staff to work with new systems. It can be done through education and training, as well as the use of special programmes and training materials;

b) the second aspect is the use of automated accounting and reporting management systems. It will allow the company to collect and process any information quickly and efficiently, reduce the risk of errors and minimize the time required to prepare reports;

c) the third aspect is the use of cloud technologies. This makes it possible to store and process the online data that facilitates the quick and convenient access to the necessary information both for the company and its partners and customers.

Generally, it can be argued that the development of information technologies in accounting and reporting is one of the most important factors that ensure the competitiveness of enterprises in Ukraine.

At the same time, it should be noted that not all enterprises in Ukraine are ready to use information technology in their operations due to limited financial resources and low staff qualifications.

Information technologies in accounting and reporting are becoming increasingly important for enterprises in Ukraine in the context of growing competition and rapid changes in the economic environment. The introduction of information systems allows the enterprises to increase accounting efficiency, reduce time for reporting, improve analytical capabilities and ensure more accurate and faster management in decision-making [4].

Today, the most enterprises in Ukraine have the appropriate information systems, but many of them do not use them to their full potential or lack of the necessary knowledge and skills in order to use them rationally. Therefore, it is important to conduct the regular training and education for employees of enterprises in the field of information technology in accounting and reporting.

All in all, the development of information **technology** in accounting and reporting can significantly increase the competitiveness of enterprises in Ukraine. However, to make it possible, it is necessary not only to ensure the availability of appropriate information systems, but also to train employees to use them rationally. Only in this way will enterprises be able to secure their place in the market and compete effectively with other economic actors.

The integration of information technologies in accounting and reporting can positively affect the efficiency of enterprises in Ukraine. In particular, the introduction of electronic document management in the accounting and reporting of enterprises

allows storing a significant amount of data in electronic form: it reduces the cost of storing documents and facilitates their quick and easy retrieval [6].

The strategic data management is an integral part of the successful operation of modern enterprises, especially given the spread of information technology in the field of accounting and reporting. This is a comprehensive approach aimed at collecting, processing, analysing and efficiently using large amounts of data to make the informed strategic decisions and optimise the business processes (Table 1):

Table 1. Key aspects of strategic data management

Main aspects of strategic management	Contents
Data collection systems	Use of modern information technologies to create the data collection systems that allow efficient and structured collection of various data from different sources
Analytical tools	Use of analytical tools to examine and analyse the data collected to identify the key trends and patterns
Identifying opportunities	Strategic data management helps to identify opportunities to improve business processes and identify new opportunities for development
Data-driven decision-making	Ensure that strategic decisions are made on the basis of objective data and analysis, making them sound and relevant to the business's goals and requirements
Identifying key trends	The ability to identify the key trends in your industry allows you to make the predictive decisions and stay competitive
Improving efficiency	Use of strategic data management to optimize the business processes and identify the areas for improvement
Quality control	Developing mechanisms to control data quality to ensure its reliability and validity

Source: compiled on the basis of [4].

The research shows that companies using information technology in accounting and reporting are more responsive to market changes and can plan their operations more effectively. In addition, the use of information technology can reduce the cost of accounting and reporting and provide more accurate and reliable accounting of financial transactions.

The development of information technologies in accounting and reporting can increase the competitiveness of an enterprise on several levels:

1) Process efficiency: the introduction of information technology in accounting and reporting leads to the automation of accounting and reporting processes, reduces the amount of manual work and helps to use employees' time more efficiently. This

increases productivity and speeds up the completion of tasks, allowing businesses to be more efficient and competitive.

2) Cost reduction: the introduction of information technology in accounting and reporting can reduce the costs of an enterprise by automating processes, avoiding errors and reducing the amount of resources required. This can also reduce the cost of maintenance and storage of documents.

3) Improving the quality of reporting: information technology enables large amounts of data to be collected, processed and analysed quickly and efficiently. This allows businesses to generate reports more accurately and quickly to assist in decision-making and planning. Improved reporting quality can enable more accurate and timely decision-making, which can help businesses to increase their competitiveness.

In addition, the use of information technology in accounting and reporting also allows businesses to respond quickly to changes in market conditions and adapt their operations to them, which also contributes to increased competitiveness. Moreover, reducing the time for processing information and shortening the time for reporting allows the companies to focus on the development and improvement of production processes, that can also have a positive impact on their competitiveness.

To sum up, the development of information technology in accounting and reporting can significantly increase the competitiveness of enterprises in Ukraine by improving the quality and speed of information processing, reducing processing costs, simplifying reporting and analysis procedures, and providing quick and accurate access to the necessary data for strategic decision-making.

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IMPACT OF INFORMATION TECHNOLOGY ON THE DEVELOPMENT OF THE HOSPITALITY INDUSTRY

In the context of globalisation, the hotel and restaurant business is in constant competition, and the effective implementation of information and communication systems is becoming a key factor in ensuring competitive advantages. The use of information technologies in the hospitality industry not only improves the quality and efficiency of services, but also expands their availability to different consumer groups.

The current stage of development of the hospitality and tourism industry is marked by the use of information technology, which not only helps to optimise work processes but also improves the quality of services. Computerised reservation systems, which have become an integral part of the industry, effectively facilitate tourism processes, providing consumers with convenience and accessibility.

The Internet, as a catalyst for a revolution in the industry, is expanding the possibilities of online interaction and providing wide access to various information. Accordingly, the hotel industry is responding to the changes by actively adapting to customer needs [1]. The use of mobile applications for booking and communicating with guests has already become a standard, and the integration of information technology solutions is being deployed to optimise workflows and improve service levels. The introduction of advanced technologies in hotel rooms is an important strategic business line aimed at meeting the needs and tastes of the modern tourist. Innovations such as smart TVs, smart technologies for the environment, next-generation security systems, robots, mobile services and digital security are being actively implemented. Automation of internal processes, smart technologies in rooms, artificial intelligence, APIs and analytics determine not only the competitiveness of hotels, but also their ability to effectively implement new solutions[2].

The development of the hospitality industry in the digital economy is shaping a technological environment where information support and digitalisation are becoming a strategic resource. The continuous collection, processing and analysis of data determines success in achieving one of the main objectives – better

understanding of customers and effective interaction with them [2]. The state, in turn, should actively promote the development of both traditional and virtual tourism enterprises to ensure that the diverse requirements of customers are fully met.

Future research is aimed at studying modern marketing technologies, which will help to expand the understanding and maximise the use of these innovations in the hospitality industry.

In summary, the hospitality industry is successfully integrating modern digital technologies, in particular mobile platforms and digital marketing, as key channels of communication with customers. In order to achieve goals such as better customer understanding and increased competitiveness, the hospitality industry must, in turn, actively use information support and strategically implement digitalisation in the digital economy, which requires the creation of a unified information space and the use of innovative approaches to management and information provision.

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THEORETICAL FOUNDATIONS OF PERSONNEL MANAGEMENT IN PRIVATE AGRICULTURAL ORGANISATIONS

The main tasks of managers of private organisations include the formation of effective ways and methods of staff incentives, selection of appropriate and optimal levers for managing employees and creation of an implementation mechanism.

It is only through the influence of management or an individual on an organised system that it is possible to put it into action to achieve the goals set. Methods of organisation and management are the manager's tools to stimulate the work and creativity of the organisation's staff, which in turn helps to achieve the organisational goals.

From the point of view of T. Sivashenko, personnel management is an activity aimed at the effective use of employees to achieve the organisation's goals and personal goals [4, p. 48].

The high potential of agricultural production, which is observed in our country and reveals great prospects for Ukraine's entry into the world market, is the fundamental reason for the opening and development of agricultural organisations of various organisational and legal forms of management. These include private and state-owned enterprises, farms, business companies of various types of liability, agricultural enterprises that are part of agricultural holding groups, production cooperatives, etc.

In the current conditions of unstable labour market conditions, the main components of labour resource management, in particular, managers of various management levels and specialists, in agricultural enterprises should be [2]:

- planning, selection, placement (movement) of personnel,
- assessment of candidates for jobs;
- formation of a labour motivation system;
- analysis and evaluation of labour performance;

Managing and managed subsystems, direct and feedback channels, as well as the environment create a management system [1].

Thus, the main components of the management system are [2]:

1) the subject of management, i.e. the source of management influence, the one who manages, performs the functions of management and influence on the object in order to bring it to a new state, desired by the subject;

2) the object of management, i.e. what functions under the management influence, on which this influence of the subject is directed;

3) managing influence, i.e. a set of purposeful and organising commands, means, techniques and methods by which the object is influenced and real changes in its state are achieved;

4) feedback, i.e. information for the subject about the effectiveness of management influence and changes in the object.

Staff development has a significant impact on improving the professional level of staff, employee motivation, the prospects and efficiency of labour activity, the level of profitability, the adoption of advanced labour methods, and the strengthening of market positions.

An important way to improve the quality of agricultural personnel is to develop the «corporate spirit» of the enterprise. To do this, each employee should develop a sense of the uniqueness of the enterprise in which he or she works. This feeling is consonant with the feeling of patriotism. It is manifested in the understanding that no one else but us can better perform the functions we perform: providing consumers with the products we produce. This gives rise to such deep feelings as the importance of your work, pride in fulfilling an exceptional mission [2].

Over time, each employee's labour efficiency decreases, which can be caused by various reasons, but to improve the performance of staff, it is necessary to form an optimal motivational system to stimulate labour activity.

The main task of this system is to stimulate the employee's state of mind, in which he or she will be happy to work more efficiently. The HR management of agricultural organisations mostly do not pay the necessary attention to employee motivation, which leads to its low level, since today salary is no longer the main factor in staff incentives.

As for the methods of personnel management, they have regulatory and controlling functions with regard to the labour behaviour of subordinates in order to achieve the goal. Classification of personnel management methods [3]:

1) Administrative methods: formation of the structure and management bodies; recruitment and placement of personnel; approval of administrative rules and regulations; issuance of orders and instructions; development of regulations and job descriptions;

2) Economic methods: technical and economic analysis; planning; financial incentives; pricing; supplementary system; economic rules and regulations;

3) Socio-psychological methods: social analysis in the team of employees; social planning; social development of the team; psychological influence on employees.

HR management systems in these groups of agricultural organisations are very similar according to the selected criteria. The differences within the first group are usually internal sources and personal connections in recruitment, and the dependence of remuneration on professional qualifications. The main feature is that employees are imbued with a «family spirit». The main feature of the second group is high employee mobility. As for the last group, it is distinguished by a narrow specialisation of personnel, development and professional development of personnel that takes place

outside the production facilities and under special programmes. A high corporate culture is its main feature.

It should be noted that the HRM systems of agricultural organisations in Group I have similarities with the Japanese system, Group II – with the European system, and Group III is more in line with the American system. It is necessary to pay attention to this and, depending on the organisational and legal forms of management, focus on the foreign HR management system whose features are most closely aligned with the organisation's goals. This will help to increase competitiveness in the global market and achieve a high level of economic performance.

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DEVELOPMENT OF TRADE AND COMMERCIAL PARTNERSHIP BETWEEN TRANSNATIONAL POLICY MAKERS WITHIN THE ECONOMIC COMMUNITY OF WEST AFRICAN COUNTRIES

In the context of the official confirmation by the European **metropolitanates**, namely the UK, France and Portugal, of the course of reforming the system of international relations in accordance with the processes of decolonization, a galaxy of dependent territories gained independence and sovereignty.

As a result, the newly formed countries of the Global South initiated the Cairo Conference in 1957, the Bandung Plenum in 1955, and the Accra Summit in 1958. The organization of these colloquia resulted in the ratification of legal acts that demonstrated the need to eliminate the mandate of a group of states in Latin America, Africa and Asia.

At the same time, the States of the Western Africa were among the vanguard of countries that leveled their status as overseas possessions of the colonial empires of Europe in the 1960s and 1970s. As a result, these countries were seen as one of the first actors in international relations to gain political and economic independence in the process of global liberalization of cross-border mutualism. However, due to the retrospective exploitation of the states of the Western Africa as resource hubs, these states did not operate a diversified economic structure, were characterized by low living standards and were interpreted as dependent on price volatility in the resource market.

As a result, in order to resolve the perturbations associated with ensuring the stable development of the socio-administrative, humanitarian, cultural and commercial system, the governments of West African states determined the beginning of the construction of regional integration processes as the only relevant option.

The purpose of this article is to systematize the information presenting a comprehensive analysis of the mechanisms of socio-political and economic evolution of West African countries in order to provide congruent liberal democratic states with recommendations for determining their future course and development algorithm. The urgency of the chosen topic is in the necessity of studying the experience of economic modernization of the countries of the Global South, which optimizes the strategies of Ukrainian specialists in the field of increasing the competitiveness of the country's economy, as well as accelerating Ukraine' industrialization and integration into the EU and NATO.

It is worth noting that in the interval of 1970-1975, a number of countries such as Niger, Sierra Leone, Mali, Guinea, Côte d'Ivoire, Ghana, Senegal, Liberia, Guinea-Bissau, Nigeria, Togo, Gambia, Benin, Cape Verde, Liberia and Burkina Faso intensified their communitarian trade and economic partnership [1, p.123]

In addition, one of the main lobbyists for the syndicalization of West African states was Liberia, which was granted the privilege of independently formulating its own domestic and foreign policy in 1847, having gained considerable experience in developing cooperation with other states. Moreover, it has to be considered that the formation of this country was denoted by the final phase of the American Colonization Society's initiative, the hermeneutics of which was developed by Robert Finley in 1816.

After the negotiations between these states were completed, the representatives of these 15 countries ratified the Lagos Treaty on May 28, 1975, which was

a demonstration of the official sanctioning of the foundation of the Economic Community of West African States (ECOWAS). In the near future, the quorum of this association was joined by Cape Verde, whose government signed the Lagos Treaty in 1976 [2, p. 385-386].

At the same time, it is portentous to specify that in 2000, the application for accession to ECOWAS was delegated by the Moroccan administrative apparatus. This process was recognized as the reason for making adjustments to the clauses of the constituent agreement in the period of July 24, 1993, validated in the city of Contou, which approved the territorial increase of the oikoumene of this interstate association [3, p. 55].

The further vector of development of cooperation of West African states in the ECOWAS constellation is associated with the signing in Dakar on January 10, 1994 of the Treaty on the West African Economic and Monetary Union (WAEMU). The agreement in question was adopted by a group of ECOWAS members, namely Senegal, Burkina Faso, Mali, Benin, Niger, Togo and Côte d'Ivoire, which during the colonial period were under French paternalism, with the exception of Guinea, as well as Guinea-Bissau, which was previously controlled by Portugal. Moreover, following the conclusion of negotiations within the ECOWAS Council of Ministers, the authorities of Guinea-Bissau accredited the tenets of a normative act on May 2, 1997, which exhibited the legal basis for the promotion of WAEMU and the statutes of this transboundary syndicate.

It is necessary to state that the fundamental objectives of the Treaty on the West African Economic and Monetary Union (WAEMU) were to materialize a range of projects in the field of synergy of West African countries. The purpose of the WAEMU institution was to incorporate acceptable conditions for the unification of economic and financial configurations of states that operated with a single monetary means of transaction associated with the CFA (the African Financial Community franc). This organization was converged after the implementation of the provisions of the Bretton Woods Treaty, concluded as a result of the negotiation process that took place between July 1 and 22, 1944, into the French legal system. As a result, in accordance with the semantics of this pact, the French authorities initiated a program to devalue the national currency in order to protect a stable and unchanged equivalent of the US dollar and franc conversion.

The priority task of the French Ministry of Finance under the CFA is to liberalize the stable transfer of products to the countries of the International Organization of La Francophonie (OIF), which historically were under the patronage of Paris as dominions.

At the same time, a group of ECOWAS members, which in retrospect played the role of British overseas territories, namely Nigeria, Gambia, Sierra Leone and Ghana, as well as Guinea, which was a former French colony, fabricated the West African Monetary Area in 2000. It is important to proclaim that in 2010, Liberia joined this association, which significantly increased the level of funding for the institutions of this association, diversifying and accelerating the development of algorithms for regionalization of West African countries. It should also be noted that the main purpose of the West African Currency Area was determined by the need to eliminate political and economic problems inherent in the export of the range of industrial products of the members of this organization.

The primary goal of this commercial institution is to codify the monetary systems of its members for the prospective introduction of a universal financial element Eco. As part of further cooperation of ECOWAS countries, the fiscal institutions of the West African Monetary Institute plan to combine the monetary mechanisms of ECO and CFA to compile a homogeneous monetary system to be used by the countries of Central and West Africa [2, p. 386].

At the same time, ECOWAS diplomats ratified a strategy for the modernization of economic, commercial, military-political and socio-administrative partnerships, which is scheduled to be implemented by 2020, called the Blueprint, at the plenary session of the Community Parliament in 2011. In addition, the ECOWAS Policy On Science and Technology (ECOPOST) was approved at a congruent meeting. At the same time, the Blueprint and ECOPOST initiatives are identified as existential components of the Vision 2020 program, approved in June 2008.

This legitimizing document is characterized by an algorithm of collective actions of ECOWAS countries in the field of ensuring the stable development of regionalization processes. The epistemology of “Vision 2020” formulates the need for decentralization, protection of civil society, acceleration of trade, investment and fiscal unification, ontogenesis of the capitalist model of economy, as well as implementation of the results of scientific progress in the agricultural and industrial sectors [4, p. 47].

Inturn, the ECOPOST platform exposed the need to establish institutions for analysis and granting subsidies to ECOWAS participants in order to effectively materialize a group of offers and interstate integration concepts.

These programs are related to the definition of the trajectory of the evolution of the education system, academic research and innovation, transnational relocation and implementation of experimental equipment at industrial conglomerations, and intellectual property protection.

ECOPOST has established communication with the New Partnership for Africa's Development (NEPAD) consortium, launched by the African Union. It should be noted that in 2007, the NEPAD association argued for the need to cooperate with the continent's states in the field of technical development within the framework of the African Science, Technology, and Innovation Indicators Initiative. The results of this partnership were the public dissemination in 2011, 2014 and 2019 of information in the African Innovation Outlook monographs related to the current results and prospects for the centrifugal synergy of ECOWAS countries.

As a result, in 2012, at the ECOWAS Council of Ministers, the delegates of the members of this conglomeration ratified the ECOWAS Research Policy Legal Circular. This document specified the need to integrate the subjects of the association in the scientific field for collective investment in the **cadastre** of technological projects, as well as the effective introduction of new aggregations into the economic system to increase the level of competitiveness of ECOWAS products [2, p. 387].

In the current period, the economic and political cooperation and regionalization of the countries of this association demonstrates regression, which is associated with the militaristic collision in Niger, which took place on July 26, 2023, leading to a permanent blocking of the state's participation in ECOWAS meetings and summits.

This escapade caused the unauthorized termination of the cadence of the leader of Niger, whose powers are granted to Mohamed Bazoum, by representatives of the Nigerian Armed Forces. As a result, the country's army structures, led by plutocrats Omar Siani, Abdou Sidik Issai, Amad Abdraman and Salif Modi, in an accelerated mode established a protectorate over the administrative apparatus of the state within the framework of a national revolution.

Correspondingly, these actors have distanced themselves from the liberal democratic paradigm of forming the doctrine of the state's political development, establishing an updated stratocratic form of regulation of Niger's domestic and

transnational activities. The consequence of this is the termination in December 2023 of Niger's membership in the G5 Anti-Jihadist Forces operating in the Sahel region, the denunciation by Niamey of the agreement on military-technical interaction with the European Union, as well as the abrogation in the range of March 17, 2024 of the pact on military cooperation with the United States [5, p. 56].

Summarizing the above material, it is worth noting that the intensification of global humanization processes in the 1950s and the further development of global humanization processes gave the states of the West African region the right to sovereignly formulate the doctrines of their own economic and socio-political systems.

To accelerate the industrialization process and offset the dependence of the national commercial model on fluctuations in global resource markets, West African countries initiated the establishment of ECOWAS, which successfully incorporated regionalization processes in the economic and business sphere. At the moment, the high level of integration of the countries of this association is determined by the inherent spectrum of perturbations associated with the military coup in Niger, organized in the interval of July 26, 2023.

However, if the behind-the-scenes contact between ECOWAS members and Niger stabilizes, preconditions will be formed for the resumption of the progress of economic cooperation between the members of this association, which in the future may give ECOWAS the status of one of the main trade actors on the African continent.

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INFLUENCE OF INTERNATIONAL ORGANIZATIONS ON GLOBAL ECONOMIC DEVELOPMENT

International organizations are large institutions that have their own levers of influence on the development of states and the lives of citizens.

Influence on the citizen in any case is carried out through the interaction of the organization with the government of the state in which the citizen lives.

Basically, the impact on the citizen is positive, because all the actions of international organizations are aimed at improving the life of society.

Various methods are used to influence the states. Development of standards, expert advice, financial assistance, political pressure and economic sanctions are among them.

All methods are co-dependent. At the beginning of cooperation with countries, aid programs begin to be applied, they go as expert support, which tries to introduce the work of previously developed standards in the country.

For the purpose of successful cooperation, international organizations are developing mandatory standards in the field of trade, ecology, human rights, etc.

At the initial stages, expert assistance is provided, which is related to the implementation of effective policies in the sphere of economy, health care and labor.

Financial aid, which is important for the development of the country and its socio-economic policy, helps to implement successful political and economic mechanisms.

If, after the assistance has been provided, there are no changes regarding the human rights, security, health care, political pressure, the economic sanctions are to be introduced.

Political pressure is a form of interaction between an organization and a state, in which other members of the organization use their authority to force countries to comply with the standards [1].

If the requirements of authoritative organizations are neglected, economic sanctions are applied. Sanctions are the most severe method of influence from the international organizations, as their consequences are completely unpredictable, they can significantly worsen complicated living conditions of the country's citizens [1].

In general, international organizations have both a negative and a positive impact on society.

The protection of human rights, which even in the modern civilized world is the most important and acute problem, has still a positive influence.

The negative component of influence is bureaucracy and inefficiency. Even the largest international organizations are beginning to be blamed for this. Unfortunately, these components reduce the impact of sanctions and the authority of the states, which in the future may threaten the safety of citizens [2].

Rapid economic development and the fight against global challenges in the 21st century positively keep the balance and reduce the negative impact on world economic development.

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CHARACTERISTICS OF THE UKRAINIAN AGRICULTURAL PRODUCTS MARKET UNDER THE CONDITIONS OF MARITAL STATE

The agricultural sector of our country has been significantly affected by the military actions of the Russian Federation. Annually, Ukraine produces about 100 million tons of grain, making it one of the world's largest exporters. Due to the military actions, the planting campaigns of 2022 and 2023 have become the most challenging since the independence of Ukraine. The occupation of territories and military operations have led to a decrease in sown areas, a shortage of labor, equipment, fuel, funds, and the destruction of logistical routes – all of these factors

have posed unprecedented challenges for agrarians. Moreover, the military actions in Ukraine have led to a drop in the domestic prices of agricultural products below the cost level in the spring of 2022. After the signing of the grain agreement, the situation improved, yet difficulties with logistics continue. The "grain corridor" in the Black Sea allows for the export of some of the agricultural products under regular air attacks on sea ports. Additionally, the situation at the border with Poland concerning grain transport by land routes is problematic, with very low throughput capacity due to strikes and protests by Polish farmers.

The agricultural product market is a system of economic relations regarding the exchange of products from the agricultural sector, combined and interconnected with the processes of their production, distribution, and consumption, which ensures the country's food security and forms its export potential. In the agricultural products market, the subject of purchase and sale includes agricultural products not only as food but also as production means for other sectors [1]. Under normal conditions, the price-forming factors in the agricultural product market include production costs, the demand and supply ratio, inflation rates, the purchasing power of money, the degree of government administrative and economic regulation of prices, the state of price and non-price competition, and the degree of production monopolization. A feature of the market infrastructure is the sale of products to intermediaries who, in turn, engage in their procurement and processing. Many external factors shape the price of agrarians' products, which is unstable and fluctuates depending on the quantity of a particular type of product offered in the market. In countries with a developed market economy, free pricing is combined with state regulation and support for producers' incomes through: setting upper and lower price limits, introducing guaranteed prices, providing subsidies to agricultural producers, and effective antitrust control over prices for material and technical resources.

Currently, Ukrainian agribusiness operates under challenging conditions, as part of its production capacities are occupied, material resources are destroyed, there's physical loss of livestock due to combat actions, destruction of croplands for agricultural cultures and perennial plantings, and disruption of the production chain for providing material and technical resources. According to analytical data from the Kyiv School of Economics for 2022, the agro-industrial complex of Ukraine suffered direct losses of \$6.6 billion due to the war. The ongoing military actions in our country and the occupation of parts of the eastern and southern regions have been the main

reasons for the reduction in agricultural production in 2022. According to the results of the agricultural year 2022, the production of grain crops decreased by 37% compared to the production indicators of 2021 and amounted to almost 54 million tons. Oil crops were produced at 17.5 million tons, which is 24% less compared to the production in 2021. The production of even reduced volumes of cereals in 2022 fully met Ukraine's internal needs for grain and allowed agrarians to export 38.4 million tons of grain [2].

The disruption of export channels due to the blockade of sea ports forced exporters to develop alternative logistical channels, such as river ports, rail, and freight transport. However, the low physical capacity of this logistical chain significantly reduced the demand for the export of Ukrainian agricultural products, while transport services for product delivery increased by 5-6 times. The reduction in demand and a significant increase in transportation costs led to an average reduction in prices for export-oriented crops by 33.7%, and the oversupply in the domestic market led to a nearly 61% decrease in domestic prices for grain and oil crops. Thus, the formed pricing policy leads to losses in the income part of Ukrainian agrarians up to 18.5 billion USD [3].

Despite the current challenges, Ukraine possesses all the necessary components for further development and utilization of the growth potential in agribusiness. This primarily involves not only increasing the export of raw materials but also finished products, as well as adopting advanced agricultural technologies for growing and harvesting crops, and improving the logistics component. Such improvements should help minimize losses at every stage and process of agricultural production. The focus on these areas can enhance efficiency and profitability in the sector, potentially leading to a significant recovery and expansion of Ukraine's role in the global agricultural market.

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**EDUCATION EVOLUTION:
A COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF
DISTANCE AND TRADITIONAL LEARNING**

Modern technologies are changing educational paradigms, leading to the development of distance learning. The question of the effectiveness of this approach compared to traditional education is becoming increasingly relevant [1; 2]. The aim of this thesis is to conduct a comparative analysis of the effectiveness of distance and traditional learning, identifying their advantages and disadvantages. With the advancement of technologies, distance learning has gained a significant advantage, providing flexibility in the learning process, access to numerous resources, and individualization of education. Traditional education also integrates technologies, but not always to the extent that distance learning does. Distance learning can influence students' motivation and their ability to interact, while traditional education contributes to group dynamics and social skills. It is important to evaluate which approach is more effective in stimulating interpersonal relationships and student motivation.

The criteria for learning effectiveness are an important aspect that determines the success of the educational process. In the context of comparing distance and traditional learning, these criteria take different forms, highlighting differences in approaches and methods. Distance learning, thanks to the use of modern technologies, offers unique advantages in terms of flexibility and accessibility. Students have the opportunity to learn at a convenient place and time, promoting the individualization of the educational process. Effective use of multimedia resources and interactive platforms can stimulate active student engagement with the learning material. On the other hand, traditional education stands out for its emphasis on personal interaction and social aspects of learning. Direct contact with teachers and classmates creates a conducive environment for the exchange of knowledge and experience. This form of education contributes to the formation of group dynamics and the development of interpersonal skills, which can be crucial in professional and social life.

Comparative analysis of learning outcomes is a key step in understanding which method more successfully achieves educational goals. This includes assessing

the level of understanding of the material, student satisfaction, and their motivation to learn. Research in this area can help determine which aspects of each method can be optimized to improve overall learning.

Thus, differences in effectiveness criteria emphasize the need to balance flexibility and personal interaction when developing modern educational strategies. The introduction of innovations and continuous research into learning outcomes in different contexts will help create more effective and adaptive educational systems. Each teaching method has its advantages and limitations. Distance learning provides flexibility in the learning process but may pose challenges in motivation and social adaptation. Traditional education promotes social interaction but may be less flexible. It is important to weigh these aspects to choose the optimal method in a specific context.

Comparative analysis of the effectiveness of distance and traditional learning emphasizes the importance of considering the individual needs and characteristics of each method. During the study, it is worth noting that the initial days of implementing distance learning could have been a challenge for both students and teachers. Common errors that arise indicate the need for additional preparation and support. Teachers faced difficulties in creating teams for lectures and interacting with students. This underscores the relevance of training teachers in modern methods and technologies to maximize the potential of distance learning. However, despite the challenges at the beginning, further experience can shape a positive attitude and effective use of distance education platforms in the future. It is important to continue research and develop tools to optimize both forms of education, creating more adaptive and effective educational systems.

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PROBLEMS OF FORMING THE INVESTMENT CLIMATE IN UKRAINE UNDER MARTIAL LAW

The paper focuses on the mechanisms for improving the investment climate in Ukraine under martial law. Russia's military invasion of Ukraine caused a large-scale disruption of chains of economic activity and destruction of infrastructure. Also, the rate of economic growth in Ukraine has always been lower compared to the countries of Central Europe. As a result, all this led to the deterioration of the investment climate in the state, and that is why the Targeted Plan for Economic Recovery was drawn up. This plan envisages not only covering the losses caused by the war, but also laying the foundations for the future reconstruction of the national economy, improving the quality of life in our country [3].

The investment climate is a set of political, economic, legal, social and other factors that ultimately determine the degree of risk of capital investments and the possibility of their effective use.

Among the main factors hindering the improvement of Ukraine's investment climate, the following can be identified:

- 1) the political situation (Russian military aggression at the end of February 2022);
- 2) unstable economic condition (inflation fluctuations, vulnerability of the exchange rate, low standard of living of the population, increase in the unemployment rate);
- 3) imperfect legal environment (corruption, monopolies, non-transparency of the judicial system, weak property rights);
- 4) high level of public debt (as of 12/31/2021 – 48.9% of GDP, as of 12/31/2022 – 78.4% of GDP) [2];

There are a number of advantages for investing in Ukraine:

- 1) favorable geographical position (Ukraine is located in the central part between Europe and Asia);
- 2) natural resources (Ukraine is one of the regions of the world rich in mineral resources).
- 3) developed agro-industrial complex (Ukraine has significant agricultural potential);

4) candidate status in the EU, cancellation of customs duties and quotas for Ukrainian exports, visa-free transport with EU countries;

5) one of the largest markets in Europe (43.5 million consumers);

6) qualified and inexpensive labor force (Ukraine has a larger number of graduates with a technological degree than other European countries. There are about 240,000 professionals working in the IT industry in Ukraine [1]);

The status of a candidate for EU membership opens up the following potential areas:

1) access to financing: Ukraine will be able to receive financial assistance for countries that are preparing to join the EU. Assistance can be provided through grants, investments or as technical assistance.

2) investment attraction: Ukraine will be more attractive for investors. EU countries will consider investments in Ukraine as investments in strengthening the EU.

3) development of cooperation: Ukraine will be a participant in EU programs and initiatives.

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MAIN TRADE PARTNERS OF UKRAINE AND FEATURES OF TRADE WITH THEM

Foreign trade represents a distinct sector of an individual country's economy, involving commercial organizations engaged in the exchange of goods (services, ideas) on international markets and parts of foreign goods on the domestic market. Ukraine's foreign trade is subject to national state regulation and is linked to the country's trade balance. This process is regulated according to the Law of

Ukraine "On Foreign Economic Activity". Foreign trade significantly influences the increase in the GDP of any country and serves as the main source of income formation for financial entities.

Positive GDP growth is facilitated by the country's export-import activity, especially under conditions of high productivity and competitiveness of domestic production. Ukraine is a country with a high level of open economy, accounting for 0.07% of global GDP and 0.3% of global exports. The main trading partners of Ukraine as of 2022 are:

- Poland: 15.1%, \$6.7 billion;
- Romania: 8.7%, \$3.9 billion;
- Turkey: 6.7%, \$2.9 billion.

As of 2022, Ukrainians have gained the highest profits from the sale of agricultural products, particularly corn and sunflower oil. These commodity groups occupy the first and second places in the export ranking, with shares of 12.9% (\$4.7 billion) and 12.1% (\$4.4 billion) respectively. Iron ore and concentrates are ranked third with a share of 7.5% (\$2.7 billion). Further down the list by export volume are agricultural products: wheat and rapeseed. Cables and insulated wires rank sixth, while semifinished products of carbon steel rank seventh. Overall, agriculture and significantly declining metallurgy remain the main sources of export earnings, as in previous years. Some elements from other industries make it into the top 20 export positions, such as cables, electricity, electric heating equipment, lumber, and furniture.

It is worth noting that after the start of full-scale aggression against Ukraine, the country has finally managed to reduce imports from the aggressor country. In 2022, Russia ranked sixth in the leaders change ranking, moving from second place. Its share in total imports fell almost threefold: from 9.1% to 3.6% (\$1.5 billion).



Fig. 1. Ukraine's export volumes by world regions, million USD, 2022 [3]

The import volume for the year 2022 amounted to just over \$44 billion compared to the sum of \$73.2 billion in 2021. Imports from Italy, Slovakia, and the Netherlands remained unchanged. There is also noted growth in trade partnerships with Poland, Turkey, the USA, the Czech Republic, and India. The main categories of goods imported by Ukraine in 2022 include: machinery and equipment, accounting for 38% of the total import volume, chemical products, which comprised 14% of imports, transportation vehicles, making up 10% of imports, mineral products (fuel), accounting for 10% of imports, and food industry products, representing 8% of imports. With the onset of full-scale war, the overall import volume decreased, which is attributed to the blockade of Ukrainian ports and damage to infrastructure, resulting in a change in the import structure. An increase in the import of essential goods and a decrease in the import of non-essential goods are observed.

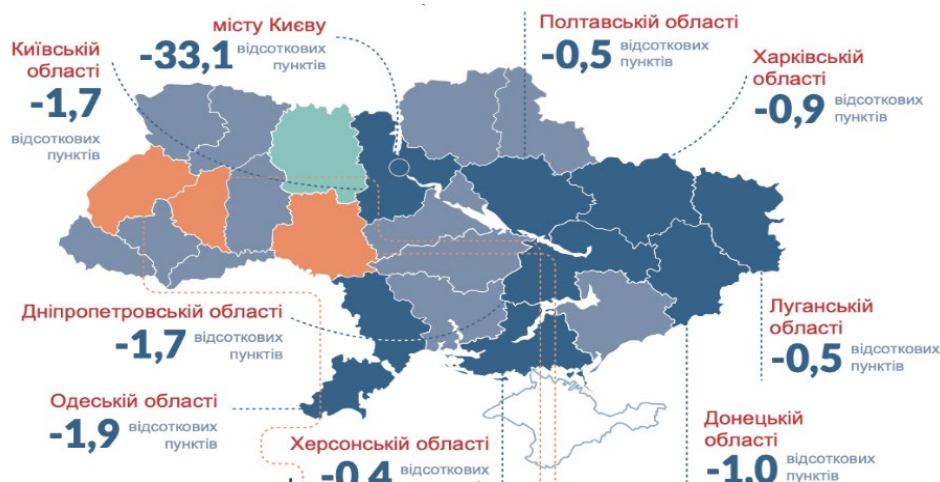


Fig. 2. Trends in the development of goods import to regions of Ukraine [4]

Trade relations with key partners are an important factor for Ukraine's economic growth. Developing and strengthening these relationships requires analysis of the economic situation, political stability, and advantageous agreements between countries.

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MODERN PROBLEMS OF DEVELOPMENT OF ECONOMIC ANALYSIS AS A TOOL FOR PERFORMANCE EFFICIENCY

The current stage of development of financial investment accounting should take into account the latest changes in the organization of the world economy, in the formation of corporate relations in the context of globalization, integration of national economies and digitalization. Since the main users of accounting and reporting information are founders and investors, i.e. owners of enterprises and legal entities, information flows should be aimed at achieving a favorable investment climate [2]. When conducting a financial analysis, it is extremely important to assess the financial performance and results of an organization, as well as to identify areas of strengths and weaknesses that can be used to improve its efficiency and competitiveness. A significant contribution to the study of the theoretical and methodological foundations of assessing the financial condition of enterprises was made by such foreign and domestic scholars as: E. Altman, L. Bernstein, U. Beaver, G. Savytska, R. Taffler, A. Sheremet, etc. Professor S. Shkaraban notes that one of the important functions of the management system at all levels is analysis. It is carried out at all stages, starting from the analysis of the strategy of any entity and ending with the final result [5, p.10].

Thanks to financial analytics, the following tasks can be accomplished:

- development of measures that will help improve the company's financial position and increase its market value;
- the ability to predict the future financial condition of the company;
- the ability to choose the best option for financing, taxation, investment, lending and many other financial transactions;
- development of diagnostics of financial problems and risks that may threaten the company's development.

The purpose of financial analysis of business activities is to forecast the further development of an enterprise, develop recommendations for making management decisions, increase competitiveness, maximize profits, etc. The urgency of the tasks related to forecasting the financial condition of state-owned enterprises is exacerbated by the instability of Ukraine's financial environment. There is a need to systematize

methodological approaches to financial analysis in the face of unpredictability and increased risks of financial activity [4]. Mathematical models (Altman, Taffler, Lees, Chesser models) are widely used to assess the financial condition of an enterprise, which form a generalized indicator of the financial condition of companies, i.e. its integral assessment. The main advantages of these models are that they:

- have a small number of indicators that ensure higher accuracy of results, with low labor costs;
- make it possible to combine different goals;
- make it possible to assess the likelihood of bankruptcy and identify possible risk areas in which the company is located.

Financial analysis should be divided into internal and external. Analysis of the external and internal environment of the company is the main structural element of financial analysis. However, such seemingly important external economic factors as consumer demand for a particular product, the company's market position, capital market conditions and its activities in the company are not involved in the analytical calculations of the company's financial performance [1]. External financial analysis is carried out by external analysts (these may be investors, creditors, partners, agencies, government agencies) based on public and available financial statements. Internal financial analysis is carried out by order and supervision of the company's management and specialists to ensure internal control, decision-making, planning and for the effective management of financial resources. In addition, internal financial analysis uses all important, reliable, up-to-date information about the company, which can be possessed only by the management [3]. Their purpose is to determine the financial attractiveness, reliability, riskiness and potential of an enterprise for investment, management, cooperation, supervision, financing and evaluation. It can be said that they complement each other and help to find realistic information about the state and use of financial resources at the enterprise. Today, the analysis of financial and economic performance indicators of enterprises is of particular importance. It is carried out using different methods, which makes it difficult to conduct and compare the results.

Summarizing the above, we can conclude that financial analysis is an important and effective tool for managing an enterprise. Financial analysis helps to identify strengths and weaknesses, find problems and risks that may threaten the company's

development. It also helps to choose the best option for the company's future development. We learned about the types of financial analysis and how it works and for what purpose. Therefore, we can conclude that financial analysis will always be an important and effective tool for managing a company.

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MAIN ASPECTS OF THE NATIONAL ECONOMY PROGRAMMING

Programming of the national **economy can be supervised as** a phenomenon in the system of state regulation of the economy. It was initiated in world practice in the middle of the 20th century. France and Japan were the first to take this path. The essence of programming in the system of state regulation of the economy consists in: analyzing the state of the national economy and drawing up a generalized forecast for the future; determination of the most rational variant of economic development from the state's point of view; development and implementation of measures to achieve the set goals [1].

The objective necessity of programming is determined by the following factors: the presence of the need for deep and relatively quick structural transformations of the national economy; insufficient efficiency of purely market mechanisms or their underdevelopment. The main tasks of programming – as a form of state regulation of the economy – are to maintain economic balance, influence the qualitative

transformation of the economy, and stimulate the development of the economy. The goal of state programming is to achieve an economic development option acceptable to the state.

Programming as a form of state regulation has the following specific features: it is a special way of state intervention in the economy, which does not eliminate the spontaneity of the movement, but only corrects it; it is an element of the modern market organization of the economy, since the state does not manage market agents, but only guides them in their behavior and mainly ensures their independence; the basis of programming is structural regulation (from the point of view of the object of programming and from the point of view of the method – selective influence); programming as a form of influence on the economy is systematic and complex, that is, it covers all spheres of factors and stages of reproduction [2].

Programming is a process of orientation of the economy introduced by the state through regular and complex influence on its structure in accordance with the option of socio-economic development within the framework of the market mechanism. According to the level of problems as objects of the programs, the following are distinguished in this way: large-scale complex programs (complex program of scientific and technical progress in the national economy; program for solving the most important social problems); development programs of the most important links of socio-economic development (housing program for the concept of raising the standard of living).

Programming as an element of state regulation of the economy has become the most widespread in the practice of state regulation of the economy of the USA, Canada, France and Japan. The resource development program of the Tennessee River, developed in the USA in the 1930s, became widely known. The development programs of the Northern regions were developed and implemented in Canada. A number of national programs were developed in Japan, the most famous of which are the «Technopolis» and «Plan for the Reconstruction of the Japanese Islands» programs [1].

Targeted, complex programs occupy a special place in the system of state programs. A complex-targeted national economic program is a directive, targeted planning document in which a complex of economic, technical-economic,

scientific-research, technical-production, organizational-economic measures is defined by resources, executors and deadlines. As a rule, many industries, economic bodies and regions take participation in this process, which allows – with joint efforts – to solve the national economic problem.

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RETAIL MARKET TRENDS IN UKRAINE

Analysing retail market trends is important for understanding changes in consumer demand and business development in the face of constant market dynamics. It helps to identify new opportunities and challenges faced by companies in the industry, to make informed decisions and implement strategies for successful market operations.

By analysing the retail market, it is important to consider the circumstances of 2022. Figure 1 illustrates that retail volume increased in 2019-2021; due to the circumstances of 2022, the volume decreased compared to the previous year, but exceeded the value of 2020. Such dynamics indicate stable growth of the retail market in stable conditions and potential for development, at the same time indicating a significant impact of the political situation in the country on the retail market.

The Covid-19 pandemic has been the first major factor to affect the stability of the retail market globally over the past five years [2]. Not having time to return to the usual rhythm of life, the domestic economy suffered even more. All these events were the main turning points in the formation of market trends. Many retailers have changed their development strategies. Although retailers have now

learned to respond immediately to new challenges, sourcing, logistics, and currency and financial transactions still remain important.

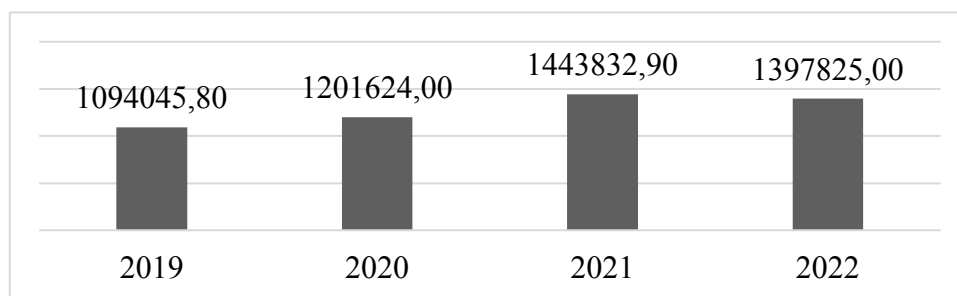


Figure 1 – Dynamics of retail turnover of retailers in 2019-2022

Compiled by the author based on data from [1]

Against this background, the topic of import substitution is gaining more and more popularity. Declining production, rising unemployment, and significant import dependence are the main threats to the domestic economy [3]. Retailers are concerned about the stable supply of their networks with goods and creating stocks as required by the military administrations, while domestic producers find it difficult to meet these conditions given the security, energy and infrastructure situation. Therefore, imports account for a significant share of the total turnover of enterprises and continue to grow.

Thus, over the past five years, the retail market has been steadily developing and increasing turnover. A full-scale armed invasion of Ukraine was a serious challenge for the industry, which was reflected in economic indicators. However, market participants are actively restoring the performance indicators of their activities and the projected trends are positive.

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TYPES OF AUDITOR'S REPORT

Compiling the audit report is the final stage of the audit. The auditor's report is an official document certified by the signature and seal of the auditor or audit firm, which is drawn up in accordance with the established procedure and contains a conclusion regarding the reliability of the reporting, completeness and compliance with the current legislation and the established accounting standards of financial and economic activity.

An auditor's report is a document drawn up by an auditor after conducting an audit of the company's accounting and financial statements. This report contains conclusions and recommendations regarding the reliability and completeness of the company's financial statements, as well as an assessment of the effectiveness of its internal control and management processes. An important part of the auditor's report is the auditor's opinion on whether the company's financial statements meet established criteria (for example, international financial reporting standards).

In accordance with the Law of Ukraine «On the Audit of Financial Statements and Audit Activity», an audit report is a document prepared by the subject of audit activity in accordance with international auditing standards and the requirements of the Law based on the results of the audit of financial statements (consolidated financial statements, combined financial statements) [1].

The auditor's report is signed by an auditor who conducts audit activities as a natural person – an entrepreneur, or conducts independent professional activities in the case of conducting an audit alone, or, at least, as a key partner in the case of conducting an audit by an auditing firm. [1].

Conceptual bases in its compilation can be laws and other normative legal acts of Ukraine, national regulations (standards) of accounting, internal requirements and regulations of economic entities, other sources.

Each standard has its own purpose and features, but the general requirements are that the auditor's report should contain a clearly formulated opinion on the financial statements. This requirement stems from the purpose of the audit, which is to provide the auditor with an opportunity to express an opinion [3, p. 55].

Elements (sections) of the audit report: Title, Addressee, Introductory or opening paragraph, Paragraph describing the scope, Paragraph in which the auditor's opinion is expressed, Date of conclusion, Auditor's address, Auditor's signature,

The auditor's report, in fact, is the bridge through which the auditor, who possesses a significant amount of information, conveys it to users in a concise form.

The main requirement for the audit report is its comprehensibility and accessibility to information users.

Table 1. Conditions for modifying the auditor's opinion in accordance with ISA 705

Type of report	
Certainly-positive auditor's report	The auditor has obtained sufficient appropriate audit evidence and has concluded that the financial statements are prepared, in all material respects, in accordance with the applicable financial reporting framework. From a practical point of view, an unconditionally positive report is drawn up when, in the opinion of the auditor, the following requirements have been met: – the auditor has received all the information and explanations necessary for the purposes of the audit; – the provided information is sufficient to reflect the real state of affairs at the enterprise; – there are adequate and reliable data on all essential issues; – financial documentation is prepared in accordance with the accounting system adopted by the enterprise, which meets the requirements of Ukrainian legislation; – financial statements are prepared on the basis of valid accounting data and do not contain significant deviations; – the financial statements are drawn up properly according to the form approved in the prescribed manner
A qualified opinion	An auditor's report, which contains a qualified opinion, is drawn up if – the auditor has obtained acceptable audit evidence in sufficient volume and, based on it, has come to the conclusion that, taken separately or in the aggregate, the misstatements are material, but not all-encompassing in relation to the financial statements; or – the auditor cannot obtain acceptable audit evidence sufficient to support an opinion, but concludes that the possible effect on the financial statements of undetected misstatements, if any, may be material but not all-encompassing
Negative	The auditor obtained sufficient acceptable audit evidence to conclude that the misstatements, taken individually or in the aggregate, are both material and pervasive to the financial statements
Refusal to provide a report	A disclaimer of opinion is noted in the audit report if: <ul style="list-style-type: none"> • the auditor is unable to obtain acceptable audit evidence sufficient to support the opinion and concludes that the possible effect on the financial statements of undetected misstatements, if any, may be both material and pervasive; or • in extremely rare circumstances, the auditor concludes that, despite obtaining sufficient acceptable audit evidence regarding each of the individual uncertainties, it is not possible to form an opinion on the financial statements due to the potential interaction of the uncertainties and their possible cumulative effect on the financial statements

Source: compiled by the authors based on [4].

The auditor's report expresses the independent opinion of the auditor regarding the reliability of financial statements, their completeness and compliance with current

legislation. That is why its quality and objectivity depends on the auditor's understanding of the essence and requirements for the preparation of the audit report.

The content and form of the audit report depends on two factors: the audit task and the type of audit opinion.

According to the materiality of the misstatements that the auditor will discover as a result of the audit, he can provide two types of audit report:

1) unmodified opinion – an unconditionally positive audit report, it is also called standard;

2) a modified report (according to the requirements of ISA 705 «Modifications of the opinion in the independent auditor's report», namely: a qualified opinion, an adverse opinion and a disclaimer of opinion), which, along with the above elements, contains an explanatory paragraph in which the reasons for the difference of opinion are disclosed from definitely positive.

Requirements for the content of the audit report are presented in Table 1.

The auditor's report is intended for a wide range of users, its publication is evidence that the client's annual accounting report, both as a whole and in all parts, complies with current legislation of Ukraine, accounting rules are reliable.

The auditor's report is the only communication channel between the auditor, external users and owners of the enterprise, whose financial statements were verified by the auditor.

An auditor's report is an important tool for various stakeholders, such as investors, creditors, government bodies and the company itself, as it provides an objective assessment of financial reporting and internal control processes.

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WORKING LIFE: IMPROVING QUALITY

Employee satisfaction is one of the most important recent developments in human resource management. It is related to the creation of programs and methods of improving the quality of working life. J. R. Hackman and J. Lloyd Suttle define the quality of work life as «the degree to which members of a production organization can satisfy their important personal needs through their work in this organization» [1].

High quality of working life should be characterized by the following: work should be interesting; workers must receive fair remuneration and recognition of their work; the working environment should be clean, with a low noise level and good lighting; management review should be minimal, but should always be carried out when necessary; workers must participate in decision-making that affects them and their work; job security and the development of friendly relations with colleagues must be ensured; funds for household and medical care must be provided.

The quality of working life can be improved by changing any organizational parameters that affect people. This includes decentralization of power, participation in management issues, training, training of management personnel, promotion management programs, training of employees in methods of more effective communication and behavior in the team. All these measures are aimed at giving people additional opportunities to satisfy their active personal needs while increasing the efficiency of the organization.

Many of the early ideas in management science revolved around designing tasks in a way that would maximize the benefits of division of labor, modern technology, and automation. An increasing number of people found that highly specialized, repetitive operations cause fatigue and loss of interest. Absenteeism and staff turnover have increased, there have even been cases of sabotage. Accordingly, the productivity gain that would normally be expected from narrow specialization has been significantly reduced. To solve the problem, a number of the most progressive companies began to experiment with the organization of work so that work began to give more inner satisfaction and more opportunities to meet higher human needs – interest, self-affirmation and personality development [2].

The two most widely used methods of labor reorganization are expanding the scope of work and enriching its content.

The volume of work is the number of different operations performed by the worker and the frequency of their repetition. The scope is called narrow if the worker performs only a few operations and repeats them often. The scope of work is called broad if a person performs many different operations and repeats them rarely. The content of the work is the relative degree of the impact that the worker can make on the work itself and the working environment. This includes such factors as independence in planning and performing work, determining the rhythm of work and participation in decision-making.

The work can be reorganized by changing its scope or content. Consolidation of work refers to the improvement of the organization by increasing its volume. Enrichment of its content involves changes due to an increase in content. When being properly developed, the program for improving the organization and working conditions contributes to the development of a sense of employee satisfaction, an increase in the quality of work, a decrease in the number of absenteeism and staff turnover.

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INFLATION AND PRICE STABILITY

Inflation and price stability are crucial issues in the economy of every country. Inflation, defined as the increase in the price level of goods and services over a certain period, affects various aspects of economic life. Ensuring price stability is a task for central banks and governmental structures as it contributes to supporting economic activity and stimulating investments. It can have both positive and negative consequences for the economy. On one hand, moderate inflation can act as

a stimulus for consumption, as people tend to spend money more quickly in anticipation of further price increases. On the other hand, high inflation can lead to the devaluation of money, a decrease in purchasing power, and market uncertainties.

Price stability is a crucial factor in achieving economic growth and maintaining long-term stability. It promotes stability in the financial market, maintains trust in the national currency, and stimulates investments in the real sector of the economy. Ensuring price stability also helps avoid the negative impacts of inflation on fixed incomes and saved monetary savings. However, an excess of price stability can hinder economic growth, as it may encourage a lack of investment and consumption. Therefore, achieving a balance between maintaining inflation at an acceptable level and ensuring price stability is an important task for economic policies.

In the context of globalization and high competition, achieving and maintaining price stability requires not only domestic measures but also international cooperation. Global markets, currency exchange, and trade relations are integral parts of the strategies of countries in maintaining stability and effectively combating inflation. Thus, inflation and price stability are two necessary aspects for the balanced development of the economy. They interact and determine economic dynamics, requiring careful regulation and coordinated efforts at both the national and international levels.

It is important to note that managing inflation and achieving price stability is a complex task, as it affects different social groups and sectors of the economy differently. Effective monetary and fiscal policies, regulation of the money supply, and control over inflationary factors are key tools that help maintain a balance in these areas. Changes in price levels affect the purchasing power of citizens and their ability to save and invest money. Lack of control over inflation can lead to significant instability in markets and disrupt socio-economic order.

An essential element of the strategy for managing inflation is adaptation to economic and technological changes. The development of digital technologies, globalization, and changes in consumer trends pose new challenges for central banks and economic regulators in ensuring stability.

In the context of price stability, it is also important to consider the impact of external factors such as geopolitical events and changes in global markets. Insufficient price stability can lead to negative consequences for external trade and exchange rates.

All these aspects underscore the importance of continuous monitoring and adaptation of economic strategies. The modern globalized economy requires flexibility and innovation in addressing issues of inflation and price stability. Inflation and price stability are two interrelated factors that shape economic conditions. Balancing their levels is a crucial task for countries and international economic systems, contributing to sustainable development and the well-being of citizens.

In the context of the digital economy, inflation can be influenced by new challenges such as rapid changes in technological trends, e-commerce, and the use of cryptocurrencies. This raises questions for regulators regarding the adaptation of policies to the new realities of the digital world.

An integral part of management strategies is also social justice. High inflation can disproportionately affect vulnerable segments of society, increasing inequality levels. Therefore, it is important to consider social aspects when developing policies for price stability.

Overall, inflation and price stability are dynamic phenomena requiring continuous study and analysis. Changes in the global economy, technological progress, and shifts in consumer behavior present new challenges for economic policymakers. Adequate management of these processes is a crucial factor for achieving economic prosperity and social stability.

In light of changes in the global economy, where technological progress and globalization define new rules of the game, effective inflation management and support for price stability become crucial tasks. Flexibility, innovation, and adaptation are key elements of strategies aimed at addressing these economic challenges. Additionally, social responsibility in inflation management is an important aspect. Regulators should consider not only economic aspects, but also the impact of policies on the level of social justice and income distribution in society.

In the face of unpredictability and instability that may arise from the global political and economic situation, it is important to emphasize the significance of interaction and cooperation among countries. Common standards and coordination of political measures can help create a more stable and predictable economic environment.

Thus, inflation and price stability remain key components of economic management, requiring not only in-depth analysis but also flexibility and innovative

solutions. Successful management of these aspects is fundamental to achieving sustainable economic development and social harmony.

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JUSTIFICATION OF WAYS TO INCREASE THE COMPANY'S PERSONNEL PRODUCTIVITY

The issue of increasing the productivity of personnel becomes important in modern business conditions, where competition is growing, and requirements for the efficiency of the enterprise are becoming more stringent. The study of this issue is relevant from the point of view of improving the competitiveness and stability of the enterprise. And the definition and substantiation of specific areas that will contribute to increasing the productivity of the company's personnel is aimed at supporting effective functioning and achieving strategic goals.

In modern conditions of the market economy, one of the main problems associated with ensuring the normal and effective development of enterprises or organizations is the problem of personnel management [1]. In the near future, the best development will be achieved by those enterprises that place the main bet on human resources and their management.

At the current stage of the development of market relations, the basis of the stable and effective work of every enterprise is the presence of personnel who are able and ready to work, as well as possessing a high level of professionalism. The human factor is the main component of production, and the costs of improving the qualifications of personnel are considered necessary and effective investments of the enterprise. No matter what the latest technologies, innovative ideas are, they will never be effective, bring maximum benefit without highly efficient work, proper training and qualification of personnel. The growth of personnel potential is

achieved only under the conditions of its continuous development, including through professional training.

For analytical purposes, all workers can be divided into:

1) the main ones – those that directly participate in the process of creating products;

2) auxiliary – those who perform main production maintenance functions.

Gradually, with the development of production, its mechanization and automation, clear boundaries between main and auxiliary workers are disappearing, and the role of the latter (in particular, adjusters, mechanics) is growing.

Forms of personnel training are types of organization of interaction of students and listeners in study groups, individual students or listeners among themselves, with teachers within the framework of certain types of classes [2]. They have a logically complete organization of the pedagogical process, which is characterized by systematicity and integrity, self-development, a personal and active nature, the constancy of the composition of participants, the presence of a certain mode of conduct.

Personnel training can be carried out using various forms and methods, taking into account the needs of the organization and the peculiarities of the training process [3].

The main forms of personnel training are as follows:

- Courses and trainings;
- Electronic learning (e-learning);
- Online courses;
- Video lectures and webinars;
- Mentoring and coaching;
- Mentoring programs;
- Coaching;
- Working groups and team projects;
- Team training sessions;
- Development projects;
- Working seminars and conferences;
- Internal conferences;
- Self-study;
- Reading;

- Online courses for self-study;
- Game techniques (gamification);
- Game scenarios.

The choice of a specific form of training may depend on the specifics of the organization, the type of training material and the needs of the staff. A combination of different methods can be the most effective for ensuring the development of personnel at the enterprise.

Thus, the study of ways to increase the productivity of personnel is relevant and necessary to ensure the competitiveness of the enterprise in the modern business environment. The results of the study can serve as a basis for the implementation of practical measures and strategies in the field of personnel management in order to improve the efficiency of the entire team.

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PSYCHOLOGICAL FEATURES OF NEGATIVE EXPERIENCES OF STUDENTS AT PRIMARY SCHOOLS UNDER MARTIAL LAW

The relevance of the topic is very high, as the mental health of adolescents is a major factor for their future life. Primary school students are very vulnerable to various stressful situations, and adolescents can experience the negative emotions and feelings in an exaggerated way due to various circumstances and their age. Low self-esteem, fear, stress, anxiety, social inequality, depression, and other factors can affect their present and future.

The concept of negative experience is one of the key concepts in psychological research, despite the fact that in the theoretical and methodological sense the term is

not sufficiently represented due to the complexity and disparity of approaches to its interpretation. In order to clarify the essence of the concept of negative experience, it is necessary to interpret the nature of the lexeme experience, which is most commonly used to denote human mental states.

In classical psychology, experiences are qualified as one of the main categories that characterize everything mental. This view, in particular, of human emotional experiences, dates back to ancient history, the ancient world. Philosophers described experiences through the specificity of culture, relationships, and activities. Concordant considerations of the content of the essence of experiences are presented by the Sophists and Epicureans, who interpreted experiences as a means of knowing oneself, as an internal dialogue that is both a form of realization and a form of being.

Therefore, this topic is intended to help both adolescents and teachers and educators. Many scientists, psychologists, and educators have addressed this issue, including: Alfred Adler, John Bowlby, Erik Erikson. The main sources of stress for students are schoolwork, relationships with classmates, and the demands of parents and teachers, so students need to find ways to support and help them. Some students may experience symptoms of anxiety and depression, so it is important for parents and teachers to be aware of changes in student behavior and respond in time. Positive experiences, such as happiness, satisfaction, and gratitude, can increase students' motivation and learning effectiveness. The experiences of children in secondary school have their own characteristics, which are related to the period of personality development and social adaptation. Experiences can relate to learning, peer relationships, interactions with adults, and personal successes and failures [1, p.176].

Negative experiences can lead to stress, depression, low self-esteem, feelings of inferiority, and the risk of developing the behavioral problems. Developing the emotion regulation and social skills can help the students to better manage their emotions, reduce the risk of psychological problems and improve the social adjustment. It is important to ensure the safety of students, create a positive environment, promote the positive relationships between students and adults, and develop the skills to regulate the positive emotions and constructive behavior [2, p.12-16].

Children in primary school experience a variety of emotions, including joy, fear, shame, anger, etc. A student's emotional state affects their academic performance. In elementary and secondary school, the students face the challenging situations,

such as conflicts with classmates or adults that can lead to emotional stress. Some students may experience anxiety and self-doubt due to low self-esteem [3, p.261-271].

Misplaced roles can lead to insecurity and fear of social judgment. Students may feel anxious about their ability to learn that can lead to lower self-esteem and motivation. Students may feel stressed by a heavy workload or high expectations from teachers and parents [4, p. 911-922].

Lack of sleep can affect students' emotional state and behavior at school. Students may experience fear of the unknown, new challenges, and difficulties in completing tasks. Failures at school or in everyday life can cause children to have low self-confidence and lower self-esteem. Parental control and support can influence the development of positive emotional states in school-age children. Students may lose interest in school or rebel against school rules. Students may experience anxiety due to lack of confidence or fear of failure. Students may become shy and have trouble communicating at school [5, p. 15-18].

Misplaced roles can lead to insecurity and fear of social judgment. Students may feel anxious about their ability to learn that can lead to lower self-esteem and motivation. Students may feel stressed by a heavy workload or high expectations from teachers and parents [6, p. 38-52].

Unforeseen changes, such as syllabus changes, can cause uncertainty and stress for some students. The immediate environment (family, friends, classmates) is important in shaping the experiences of primary school students. Developing the social skills can help to reduce stress and increase students' psychological comfort. Girls are more likely to suffer from depression than boys. Primary school students may face a variety of stressors, such as learning, peer interactions, and family problems. Stress can contribute to poor academic performance [7, p. 83-96].

Children in primary school experience a variety of emotions, including joy, fear, shame, anger, etc. A student's emotional state affects their academic performance. In elementary and secondary school, the students face the challenging situations, such as conflicts with classmates or adults, that can lead to emotional stress. Some students may experience anxiety and self-doubt due to low self-esteem [8, p.12-22].

Adolescents can be more sensitive than adults, so care should be taken when dealing with them. They may be nervous about performing in assemblies, concerts, or exams. The pressure to excel in school can lead to increased stress and workload. Adolescents may experience conflicts with peers and teachers, which can affect their

mental health. Stress related to school can affect students' health, especially if they do not have enough time to have a rest. Adolescent sensitivities can lead to feelings of inferiority due to the age difference. Many students may feel alienated from their parents, especially during the transition to adolescence.

Negative experiences of primary school students are interpreted as emotions based on unpleasant subjective and objective experiences that activate the mechanism of adaptive behavior aimed at eliminating the cause of danger (physical or mental). In adolescence, negative experiences are manifested in the failure to satisfy the supra-situational needs for intimate and personal communication with peers, approval, respect, as well as the need for emotional contact – emotional closeness with significant others that acquire individual, intimate and social meaning.

Negative experiences are caused by individual, personal and social characteristics. The individual ones are justified by emotional stability – emotional instability, relaxation – tension, anxiety – calmness (balance). Personal ones are related to psychological formations in the emotional and volitional sphere of an adolescent. Social reflects the attitude to the social environment and one's place in it (school environment, academic activities, relationships with teachers, parents, including unmet needs in relationships, bullying, lack of positive communication, parental anxiety, overprotection, etc.); negative experience in different reference groups; communication in social networks, computer addiction, information from TV advertising (reports of disasters, destruction, natural disasters, horror films, action movies, crime situations, scary cartoons and fairy tales). It is important to correct and prevent the negative experiences for the full development of a primary school student's personality.

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FACTORS INFLUENCING THE BUSINESS ACTIVITY OF THE ENTERPRISE

In the modern conditions of the functioning of economic entities, the analysis and evaluation of financial and economic activity have acquired great importance. One of the prerequisites for ensuring the efficiency of the enterprise's activity is a high level of business activity, therefore it is important to assess the state of the enterprise in this direction and look for ways to improve the activity.

An important stage in the analysis of the level of business activity is the determination of the main factors affecting the activity of the enterprise in its environment.

In general, this type of analysis is quite widespread. It is used by financial managers, analysts, accountants to solve various tasks. It can be assessment and prediction of financial risks, planning of financial strategies, valuation of assets, etc [2].

Factors influencing business activity can be divided into external and internal.

The enterprise cannot influence the action of external factors, therefore it is necessary to take into account the risks of the external environment and develop an effective mechanism for reducing their impact. Internal factors directly affect the enterprise and characterize its activity.

In particular, the parameters of internal business activity include [1, p. 88]:

- 1) the image of the enterprise in the environment, its competitive position on the market – the purpose of activity, qualifications of management and personnel, the speed of adaptability to changes;
- 2) principles of activity – the concept of the main activity, labor stimulation, diversification of production;
- 3) marketing strategy and sales system – market segmentation, product promotion tools, advertising policy;
- 4) financial management – financial condition, efficiency of resource use, profitability of activity;
- 5) social activity – participation in solving socially important issues, for example, reducing the level of unemployment, forming social infrastructure, environmental protection activities of the enterprise, etc.

External factors influencing the level of business activity of the enterprise include [1, p. 90]:

- 1) factors of the international level, which combine general economic factors, the influence of international politics and competition – the volume of foreign economic turnover, inflow of foreign investments;
- 2) national, containing political – relations with other countries in the political environment, economic – level of economic development of the state, inflation rates, tax policy, level of population income, demographic factors – birth rate, death rate, population depopulation;
- 3) market – availability of competitors, availability of necessary resources in the markets, economic ties with market participants, conditions for entering the market;
- 4) technological factors – the level of technology and technology, the development of scientific and technical progress, the introduction of innovations, the specific weight of science-intensive industries and products;
- 5) natural and climatic factors – geographical location, environmental conditions, natural conditions, etc.

Therefore, the factor analysis of the business activity of the enterprise is important in identifying problematic aspects in the management of the enterprise and will make it possible to find reserves for increasing the level of activity of the enterprise.

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A. Voloshyna, N. Bondarenko, T. Vorova

RISK MANAGEMENT IN THE ECONOMIC SECURITY SYSTEM OF THE ENTERPRISE

Economic security of entrepreneurship is a necessary principle that should be observed in order to maintain a stable economic and social situation, increase defense capability, and avoid conflicts that are a threat to the security of the state. Economic security as a system provides effective protection of enterprise assets, reliable functioning of economic processes, liquidation and minimization of financial losses.

The concept of "economic security" was initially considered as a reliable protection of information (commercial secrets), but due to changes in the country's economic functions, this term acquired a broader meaning.

Currently, the economic security of the enterprise can be considered as the state of the company's resources and business skills, in which stable work, dynamic scientific-technical and social development, as well as the possibility of prevention or rapid response to internal and external threats can be used most effectively [1].

The main activity in economic security is the minimization of the influence of internal and external threats of financial, informational, material and personnel origin.

Economic security aims to ensure the efficient operation of the company. The operating system of this enterprise should be productive and ensure the appropriate level of well-being of employees, high quality of business processes, rational use of resources and continuous development of the company [1].

Company managers usually pay due attention and take seriously the external economic security of business. However, due to the application of simple and

outdated methods of forecasting and risk management, problems often arise regarding the economic security of the enterprise. Risks, in turn, can be classified as: operational, emergency, market, organizational, project. Most of them, under certain conditions, can fall into the category of security threats. Some risks may have the consequences of the appearance of several threats to the company's security at once.

The system of economic security is risk-oriented, that is, it is aimed at identifying, analyzing and evaluating risks for making a management decision to ensure security. Risk management is a systematic process of identifying and assessing company risks and taking measures to protect the company from them.

Currently, some managers assess risks not only as a negative phenomenon that causes losses and harms the company's development. Under certain conditions, risks can positively affect the work of the enterprise by providing new opportunities. Risk optimization helps to find a balance between the negative side of risks and the benefit of the enterprise's activities in the conditions of risks.

In a volatile economic situation, businesses must use risk management to analyze possible risks and to balance potential benefits against potential problems and prevent mistakes.

The task of risk management is forecasting and taking measures to prevent or control losses within the enterprise.

The risk management process includes determining the impact on potential losses, measuring their impact and making a decision to protect the company, taking into account the nature of the risks. This activity is usually done by risk managers. They analyze different methods to prevent, limit and prevent risks, and then choose the method that is properly oriented to the company's goals and takes into account the available resources. A method that is most appropriate for one project may be completely ineffective for another. To guarantee the desired result, after implementing the chosen method, it must be carefully controlled.

Therefore, it can be concluded that in order to obtain the desired result, the company must choose the risk prevention method very carefully. Sometimes even qualified and experienced risk managers cannot correctly identify all possible consequences of certain economic risks in advance, for the stable functioning of the enterprise, managers must deal with ensuring economic security and risk management.

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K. Yermolova, Yu. Honcharova

INVESTMENT ATTRACTIVENESS OF THE COMPANY

In today's realities, investment attraction plays a large and important role in the activities of any enterprise, as it ensures efficient operation, promotes sustainable development, allows to update and increase its production, expand the material and technical base of its activities, thereby increasing the competitiveness of the enterprise. Therefore, for the successful and sustainable development of an organization, it is necessary to raise capital from external sources. By investing, organizations strengthen their competitive advantages, expand production, and introduce the latest technologies.

An investor determines the investment attractiveness of an enterprise when determining the feasibility of investing in a selected object. To attract investment, an enterprise needs to be sustainable and competitive, since any investor is interested in maximizing the profitability of its investments and minimizing risks. Therefore, it is customary to consider the indicator of investment attractiveness as a generalized indicator of the expediency of investing investment resources in the activities of any enterprise. Investment attractiveness is a set of factors and characteristics of an enterprise that allow an investor to choose it as an investment object [3, p. 61-64].

A thorough and timely assessment of the investment attractiveness of an enterprise is very important for an investor, as it helps to minimize the risk of unsuccessful investment. The main task of the investor is to choose an investment object with the best opportunities for development and high investment efficiency. In analytical practice, the assessment of the investment attractiveness of an enterprise is divided into three main approaches: market, accounting and combined (financial) (Fig. 1) [1, p. 217-224].

Each of the above approaches has its advantages and disadvantages. For example, the advantages of the market approach to assessing investment attractiveness include

the use of common criteria and the objectivity of the indicators used, while the disadvantages include the inability to use securities instruments due to the underdevelopment of the stock market effectively. The advantage of the accounting approach is the use of traditional financial and economic indicators and information availability, while the disadvantages include limited assessment of financial aspects and duplication of information. The advantage of the combined approach to assessing investment attractiveness is the formation of a generalized indicator, taking into account quantitative and qualitative parameters, and the disadvantage is the difficulty in achieving accuracy and objectivity of the assessment itself [2, p. 81-89].

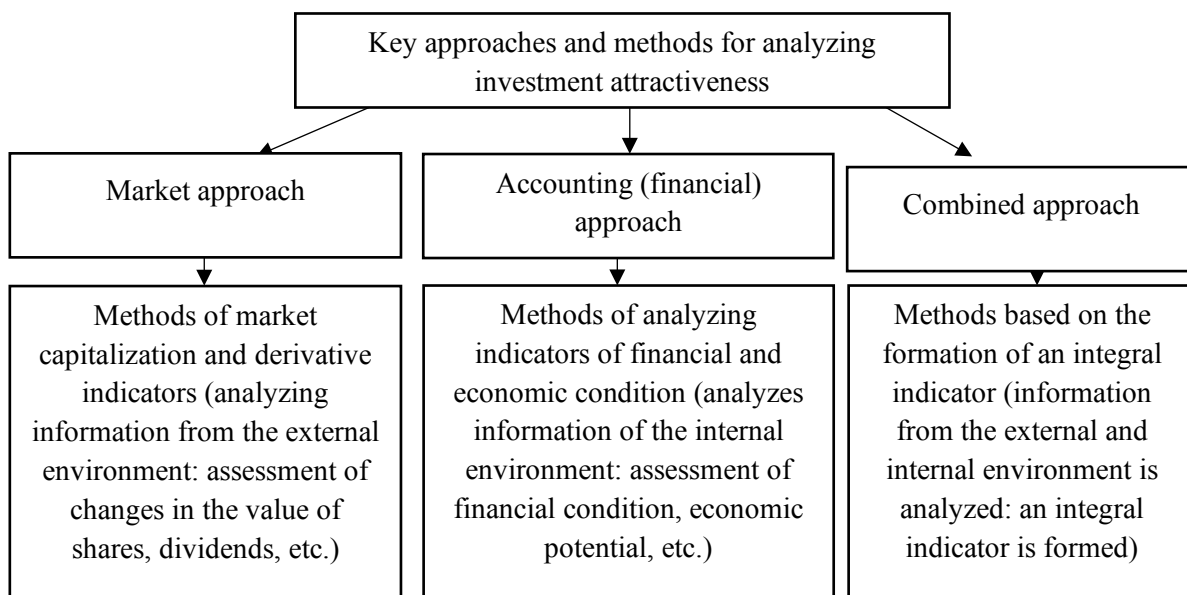


Fig. 1. Basic approaches and methods for analyzing the investment attractiveness of an organization

Thus, the main criterion for the successful development of an enterprise is its investment attractiveness, and an effective methodology for its assessment is a fundamental tool when choosing an investment object. It allows to obtain objective, holistic data about the organization, assess the current state of financial stability and prospects for its development. The relevance of the research makes it possible to assess the company as an object of investment attractiveness and predict the prospects for its future activities comprehensively.

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PANEL 4

Actual Problems of Engineering and Technical Sciences and Modern Information Technologies

(DNU, Zoom)

V. Alekseenko, V. Bucharskiy, O. Hurko

REVIEW OF MODELS FOR SELF-PRESSURIZING PROPELLANT TANK DYNAMICS

The self-pressurized feed system is a type of gas-pressure feed system, where the pressurization working fluid is retained in the liquid state to reduce tank volume. The liquid pressurization working fluid is heated and gasified in the heat exchanger from the hot propellant using a regenerative cooling strategy.

The oxidizer in the case of many hybrid rocket propulsion systems is nitrous oxide. Thermochemically its performance is similar to hydrogen peroxide or nitric acid, but often it is operationally easier to use. The primary reasons are that it is non-toxic, requires little or no thermal control, and is therefore relatively easy to handle. Additionally, nitrous oxide's vapor pressure at standard conditions is high enough that often an external pressurization system is not necessary.

Several scientific groups have developed models for nitrous oxide tank dynamics (see, for example, Whitmore & Chandler [1], Zilliac & Karabeyoglu [2], and Casalino & Pastrone [3]). However, while these models have been managed by these researchers to reproduce their own experimental results they operate conflicting assumptions and it remains unclear which model (if any) can be used for your own system. This uncertainty stems from the fundamental lack of knowledge about what is going on inside a draining self-pressurized propellant tank.

We consider three models: an equilibrium model, a non-equilibrium model similar to Zilliac & Karabeyoglu, and the non-equilibrium model of Casalino & Pastrone.

Equilibrium models for nitrous oxide tanks have been presented by Zakirov & Li, Whitmore & Chandler [1], and Casalino & Pastrone [3]. This model includes heat transfer between the fluid and the walls, which Zakirov & Li included but

Whitmore & Chandler and Casalino & Pastrone did not. The equilibrium model is by far the easiest to implement and solve, with the simplest differential equations and requiring properties only at saturation. Sometimes it accurately predicts the pressure time history, and other times it gives values higher than experimental data show. It cannot capture the initial transient. It does not accurately produce temperature time histories, at least when compared to the small-scale data of Zimmerman.

In a paper by Zilliac & Karabeyoglu [2], a model is presented that builds a level of complexity onto the equilibrium model by allowing the liquid and vapor to be at different temperatures and directly calculating the heat and mass transfer between the phases. This model is the hardest to implement and requires an equation of state in order to calculate properties away from saturation. Solution times are also the longest of the three racy.

In a paper by Casalino & Pastrone [3], two different models for self-pressurizing propellant tank dynamics are presented, in particular: an equilibrium model and "two-phase lumped model". In terms of implementation and solution, the Casalino & Pastrone model is a compromise between the equilibrium and Zilliac & Karabeyoglu models. It has more complex differential equations than the equilibrium model, but only needs properties at saturation and hence does not require a full equation of state.

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OPTIMIZATION OF THE ACCUMULATOR TANK FILLING MODES OF THE XENON FEED SYSTEM FOR ELECTRIC PROPULSION SYSTEM

The xenon feed system (XFS) is crucial part of the electric propulsion system. It ensures accurate supply of the required amount of working substance to the anode and cathode units of the thruster. The accuracy, stability, and reliability of the XFS are essential for maintaining optimal thruster operating modes and overall electric propulsion system.

A key aspect of the XFS is its ability to maintain the mass flow rate of the working substance with high precision, typically within $\pm 5\%$ [1; 5; 10]. The accuracy of maintaining the mass flow rate depends on the accuracy of upholding the pressure in the XFS. For this purpose, an accumulator tank is usually used to reduce the pressure from a high level (12.5 MPa) to the operating level (0.1-0.2 MPa) and stabilise it.

The analysis of literature sources showed that the problem of accurate maintenance of the mass flow rate of the working substance when using small-volume accumulator tanks is typical and has not been solved yet. The methods of ensuring the necessary mass flow rate of the working substance specified in the particular works (such as increasing the volume of the accumulator tank, implementing two-stage pressure regulation, installing of a flow regulators or a thermothrottle after the accumulator tank, and using of the “bang-bang” mode as a method of filling the accumulator tank) do not solve all the requirements put forward by the spacecraft to the XFS mass, dimensions, power consumption, service life, reliability, and price. All this makes it possible to assert that it is ongoing research to improvement of the accumulator tank filling method in order to upgrade the performance of XFS while reducing the volume of the accumulator tank.

The aim of this research is to refine the filling modes for accumulator tanks while minimizing the size of the XFS and reducing the frequency of solenoid valve activations. To achieve this objective, the following tasks were achieved:

1. Following theoretical and experimental investigations of the XFS of the electric propulsion system SPS-25, it was established that decreasing the volume of the accumulator tank results in pressure spikes that exceeding the acceptable range of $\pm 3\%$ of the nominal value. Research spanning inlet pressure from 2 to 7 MPa

facilitated the correlation identification between pressure spikes in the accumulator tank and the inlet pressure. Utilizing this data, enhancements were implemented to the accumulator tank filling method to maintain the required pressure within the system, despite a reduced accumulator tank volume, ensuring stable operation of the electric propulsion system.

2. The precision of maintaining pressure in the accumulator tank of XFS SPS-25 was validated through laboratory experiments and telemetry data obtained during spacecraft operation in orbit, confirming the effectiveness of the enhanced accumulator tank filling method. According to the study results, the pressure maintenance accuracy of the compact accumulator tank (0.45 L) remained within $\pm 3\%$ over the entire inlet pressure range from 2 to 12.5 MPa. At maximum inlet pressure, the improved filling method resulted in a fourfold increase in pressure maintenance accuracy within the accumulator tank compared to the method based on feedback from the pressure sensors.

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BIOPOLYMER NANOCOMPOSITES FOR THERMAL SHIELDS OF METEOROLOGICAL ROCKETS

As the density of the atmospheric layers increases consistently during entry, the nosecone is exposed to ever-increasing drag forces. The effect of these drag forces during supersonic entry leads to shock wave formation. These shock waves further lead to a phenomenon called aerodynamic heating and hence, the development of an elevated temperature profile over the surface of the nosecone stage. Whilst the exact temperature that can potentially develop is dependent on the tumbling motion of the nosecone, if no change in orientation is achieved for timescales below a hundred seconds, temperatures between 100 and 500 °C are to be expected. Whilst these temperatures can be sustained by the aramid lines of the drogue parachute, they cannot be sustained by the nylon lines of the main parachutes and hence, the heat shield that protects the outer surface of the recovery module before drogue deployment becomes a requirement [1].

Biopolymers are polymers obtained from certain living organisms, making them biocompatible and having various functional groups that allow controlling the interface with nanofillers. They are used in many fields due to their flexibility in processing conditions and competitive cost of final products. This work proposes the use of composites based on biopolymers with inorganic nanofillers such as metal, metal oxides, semiconductor nanoparticles, and carbon-based nanoparticles for application in creating thermal shields for meteorological rockets [1].

Unlike conventional polymer composites, the thermal and mechanical properties of nanoscale fillers, combined with other characteristics, have led to the development of macro-scale materials with highly desirable properties. By using the technique of affine deformation to obtain nanocomposite films from suspension, a composite can be obtained that will have resistance to transport phenomena, such as diffusion. This,

combined with the low thermal conductivity of the polymer, demonstrates high fire resistance even for very thin thicknesses. Additionally, high alignment combined with the addition of a much stiffer filler, such as nanoclay, has led to the development of biopolymer nanocomposites with an elastic modulus ranging from 10 GPa to 30 GPa depending on the loading. It has also been observed that even at elevated temperatures, this modulus value remains above 10 GPa for a certain content of montmorillonite in sodium alginate. For example, the relationship between the elastic modulus and temperature depends on the concentration of nanoclay [1]. See Fig. 1.

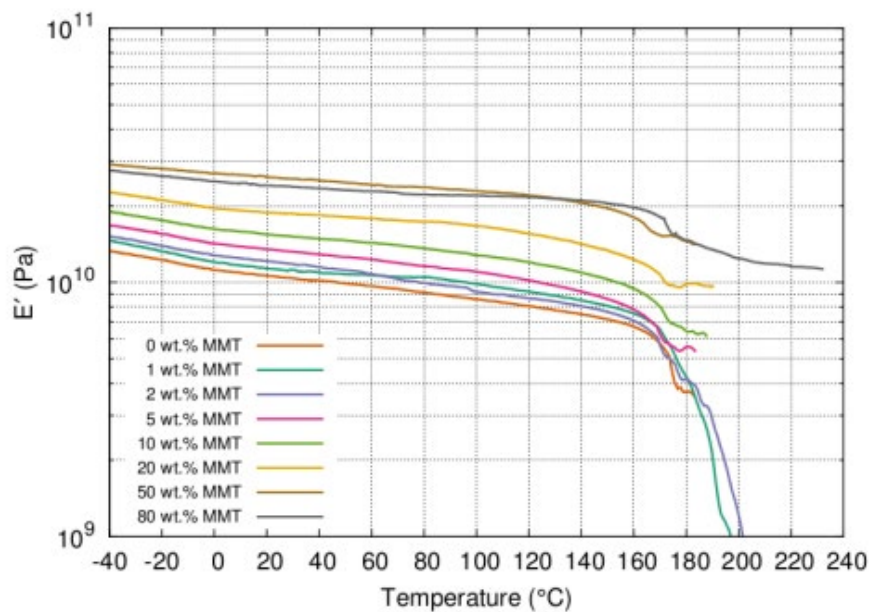


Fig. 1. Dependence of the elastic modulus on temperature

Despite these properties only meeting a portion of the requirements expected from a thermal shield, transforming the biopolymer nanocomposite into a solid substance, such as foam, can satisfy all criteria set for the thermal shield. Because foam is lighter than the original phase material, the density of the thermal shield is further reduced. Additionally, since the gas phase tends to occupy a larger volume fraction in low-density foams, further reduction in thermal conductivity can be expected. Thus, by deciding to develop a biopolymer nanocomposite foam, a durable product can be created that sets a new standard for insulation-related applications [2].

Simple production offer methods by which biopolymer nanocomposite foams of different relative densities can be produced. It was possible to use all three methods to produce foams with relative density values spanning from a minimum value of 0.017 to a maximum value of 0.891 [2].

Whilst it is easy to say that the preliminary thermal characteristics and the ease with which the foams can be produced guarantees their ability to work as hypersonic heat shields, it becomes important to assess the mechanical behaviour of these foams in order to guarantee their use as/within structural components. This was identified as being rather elusive due to the inconsistencies that were noticeable in existing analytical/numerical models to estimate the elastic modulus of foams [2].

The process of transforming nanocomposites into foam does not affect their ability to function as fire-resistant materials. These foams were able to provide a temperature gradient between 1.5×10^5 and 3.2×10^5 K/m under the influence of high-temperature propane-butane torch flame for 2 minutes. These values can be compared with the temperature gradient offered by high-temperature tile-based thermal protection systems on board the NASA Space Shuttle [2].

In this study, foam materials with single relative densities were considered of importance to understand the underlying properties. But since it is now understood that the production techniques offer great versatility when it comes to the properties of biopolymer nanocomposite foams themselves, a stacked structure using foams of different densities can also be trialed [2].

As the baked foams consistently provide the best results, there's enough reasons to suggest a more consistent grasp of their mechanical properties. Amongst the reasons listed for deviations in the baked foams' elastic modulus values, it is hard to gain consistent control over the amount of moisture present within the sample or the cracking within the foam. However, the level of exfoliation can be studied closely. To that effect, a detailed X-Ray Diffraction (XRD) study can be carried out to understand how changes brought about to the baking process can improve the exfoliation of the nanoclay. Although limited control can be expected over the cracking, tomography scans could also reveal an improved insight into the distribution of these cracks within the baked foams [2].

Only the thermal gradient that develops as a result of exposure to high temperatures was considered of importance in this study. This property was expected to critically define the dimensions and densities that become suitable for future considerations. However, understanding the heat capacity of these foams at different temperatures and different purge environments could also prove useful. This would help in assessing their thermal characteristics in different atmospheric conditions, by understanding their underlying chemical changes [2].

So far, only the static – elastic compressive modulus of the foams have been evaluated. However, for a system as dynamic as entry into the Earth’s atmosphere, multiple load cases persist. It then becomes important to assess the behaviour of these foams when loaded flexural, or in shear, or using an oscillating load. These load cases serve to highlight the likelihood of failure of the foams when utilised structurally and address the limitations of the foam [2].

Finally, a detailed in-flight testing regime aboard a suitable sounding rocket would not just serve as a demonstration mission, but also provide suitable testing data under different flight conditions [2].

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B. Bondarenko, T. Pavlova, M. Sidorova, Yu. Honcharova

APPLICATION OF VIRTUAL REALITY IN THE DEVELOPMENT OF FITNESS APPLICATIONS

The problems of not getting enough exercise, sedentary lifestyle, and dealing with excess weight have been around for a while. These issues weren't new even before the COVID-19 pandemic, but according to a publication in the "BMC Public Health" journal [1, p.3], things got worse when the pandemic hit. The number of factors contributing to these problems increased, making the situation even more challenging.

It is widely recognized that activities, be it educational processes or engaging in physical exercises, are more readily embraced when presented in a gamified format. Research findings [2, p.14] indicate that incorporating virtual reality into physical exercise regimens is not only effective but also holds promise in positively influencing both physical and psychological well-being. Consequently, the creation of fitness applications integrating virtual reality represents a notably beneficial, pertinent, and underexplored endeavor.

The objective of this thesis is to examine the utilization of virtual reality for stimulating physical activity, as well as to analyze contemporary fitness applications, and explore available tools for their development.

Within the fitness applications market, prominent products include Beat Saber, Les Mills Body Combat, FitXR, Supernatural, Headspace, VireFit, HOLOFIT, Sparc, Holopoint, Knockout League, Superhot, Echo Arena, AudioShield, Raw Data, ROM: Extraction, Holoball, and many others. Each of these applications exhibits a unique set of strengths and weaknesses.

Among the advantages, notable features include engaging workouts employing diverse mechanics, adjustable intensity levels, high-quality graphics, and the option for collaborative team training.

The prevailing drawbacks are the monotony or predictability of the gameplay, insufficient updates, inadequately designed physical exertion ranging from overly light to potentially traumatic, subpar graphics adversely impacting overall well-being, and an absence of comprehensive training elements, among other issues.

A common issue observed in many applications is the absence of sustained motivation for users to persist in their training endeavors. Addressing this concern could entail the development of a fitness application that combines the strengths of existing applications while incorporating distinct features designed to inspire repeated and consistent usage by the user.

Incorporating virtual reality into an application poses a considerable challenge owing to the diverse array of devices available from different manufacturers, including headsets, glasses, joysticks, suits, LCD screens, and specialized simulators, each characterized by unique specifications and distinctions.

Notably, the predominant tools for crafting virtual reality applications are Unity, Unreal Engine, and Godot. These game engines, in addition to their primary advantages, offer comprehensive documentation and developer guides to facilitate the integration process.

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OPTIMIZATION OF MANUFACTURING PROCESSES AND STRATEGIES FOR INCREASING THE FREQUENCY OF LAUNCHING ROCKETS

The space industry is one of the leading sectors of the world economy and is characterized by high-tech and science-intensive activities. It is necessary to note its significant impact on modern life, for example, providing satellite communication and navigation, enabling environmental monitoring using satellites. Currently, the production of launch vehicles, which deliver the payload into space, is quite lengthy and can take up to several years. Of course, the time spent on production varies depending on the type of rocket, its complexity, and the technology used. Today, there are strategies to accelerate this process and, as a result, increase the number of launches.

1. Large series of production will allow to optimize the logistics of supply of materials and components, to reduce costs per unit of production, and also enabling the advantageous implementation of automated systems that can perform routine assembly operations more efficiently.

2. Preservation and reuse of stages will save time, materials, and costs on manufacturing new stages. It will also reduce the cost of space missions, making space more accessible for scientific and commercial projects.

3. Manufacturing conditions that reduce the time required to transport rocket components between locations. For example, SpaceX designs and builds reusable rockets and spacecraft at its headquarters, where fully assembled rockets can be seen under one roof [1].

4. Using the concept of integrated working groups, where specialists from different fields work together on a common task, allows for identifying and resolving issues quickly [2].

5. Utilizing 3D printing allows for simplifying designs, reducing weight, and manufacturing elements with complex shapes, such as engines, structural element housings, control system parts, and fairing components.

Using SpaceX as an example, one can see how effective these strategies are: in 2020, there were 26 launches of the Falcon 9 launch vehicle, while in 2023 there were 96 launches, with 87 utilizing reused stages.

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COMMUNICATION USING MULTI-FACTOR ENCRYPTION WITH SECOND FACTOR VARIATIONS

The growing number of web service and radio receiver integrations necessitates the encryption of confidential data at all levels. Standard security methods, such as Basic Authentication and Digest Access Authentication, do not cover the advanced content encoding methods of transmitted messages that require a secure communication channel. Using a second factor in such systems will eliminate third-party interference with the channel and nullify the chances of obtaining the original content of requests [2, p.5-6].

Known 2FA application protection methods [1, p. 8-12]:

1. One Time Password (OTP) – a password that is engendered once, randomly, and can be sent via SMS or generated using a dedicated application.
2. Biometric Authentication – uses the user's physical characteristics, such as a fingerprint or iris scan.
3. Hardware Key – a physical device for generating random codes.

Main advantages of using 2FA encryption [1, p. 8-12]:

1. Increased security: This is an additional layer of security that makes it difficult for attackers to access data.
2. Adaptability: Code generation can take place without access to the Internet and the ability to combine several authentication methods. The variability of their use intervals ranges from seconds to weeks or months.
3. Convenience: Does not require any technical knowledge or special user skills.

Main disadvantages of using 2FA encryption:

1. Cost: Hardware and biometric keys are very expensive to use.

2. Complexity: They can be difficult to set up and as a result special skills are necessary for their combining.

3. Incompatibility: Inability to use some methods on specific platforms.

The proposed approach to the development of web service and radio receiver integrations allows for flexible system configuration methods, complicates access to transmitted data in real time, and in case of their storage on a medium. Combining 2FA methods with classical cryptography will significantly improve system security. The development of technologies and portable gadgets makes it easy to integrate into existing services.

Research on the vulnerabilities of this method has shown a fairly good level of protection. But it has drawbacks in social engineering, a weak first factor of protection, loss of a physical key, and architecturally incorrect solutions in software development.

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SELECTION OF VIBRATION PROTECTION FOR ROBOTIC PLATFORMS

In the modern world, there is a noticeable increase in the utilization of robotic platforms across various sectors of engineering and manufacturing. They are actively employed in transportation, agriculture, as well as in the realms of security and surveillance, demonstrating their flexibility and versatility, thereby enabling the optimization of diverse processes and enhancing operational efficiency under varied conditions.

A robotic platform can be viewed as a working mechanism, comprising a sufficiently rigid body connected to a stationary base through elastic elements. Ensuring acceptable vibration parameters of such a construction becomes imperative.

Thus the vibrational isolation device constitutes a pivotal component of the vibration protection system, tasked with generating a motion regime initiated by predefined excitations, aimed at safeguarding the object.

Research and analysis of known vibration isolation structures, as well as the derivation of dynamics relationships between linear and nonlinear oscillations, remain pertinent. Further formulation of optimization tasks, refinement of existing, and synthesis of new mechanical dampers to mitigate detrimental consequences of technogenic and natural disasters associated with mechanical breakdowns of mechanisms, machines, and structures, have been explored.

In turn, vibration protection methods are highly diverse, with their selection largely dictated by the nature of the vibration source. In cases where influencing the vibration source is infeasible, various technical means are employed to attenuate vibration transmission and mitigate its adverse effects on the subject under investigation.

For all mechanical systems, two approaches to reducing mechanical oscillations exist: elimination of resonance phenomena or augmentation of mechanical energy dissipation within the object. The former method is applied to linear systems, which do not encompass a robotic platform as a rather complex technical entity. Hence, it is judicious to resort to enhancing mechanical energy dissipation achievable through vibration isolation. The function of vibration isolation boils down to loosening the connections between the source and the object, thereby reducing the dynamic actions transmitted to the object.

In control systems of robotic platforms, executive devices influence passive elements: mass, spring, damper, while also facilitating the ability to alter the sequence of activation of various control links, namely, by perturbation (force or kinematic) and deviation (feedback of acceleration, velocity, displacement). The incorporation of active control elements expands the capabilities of dynamic vibration damping, as it permits continuous adjustment of dynamic damper parameters based on the functions of acting disturbances, thus effectuating damping under variable vibration loads.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE DEVELOPMENT OF THE AEROSPACE INDUSTRY

Artificial intelligence technologies have rapidly entered our lives. In many industries, this has resulted in significant advances in automation, improved productivity, and reduced risk. Let's consider how these technologies were transformed into the aerospace industry.

In the aerospace industry, artificial intelligence plays a critical role in many aspects, from design and development to mission management and equipment lifecycle support. Our country is one of the main participants in the development of robotic systems in the aerospace industry. Let's take a look at the certain efforts it is making to facilitate this process and what benefits this phenomenon determines for our country.

Artificial intelligence in the aerospace industry ensures high accuracy of tasks, reduces the human factor and contributes to increasing the efficiency of research and development of new technologies. In addition, one of the key areas of application of artificial intelligence in the field of aerospace technologies is autonomous systems. They are able to make quick and accurate decisions in conditions where human intervention is impossible or limited.

Considerable attention is paid to the development of intelligent flight control systems that allow aircraft to operate more efficiently, reducing fuel consumption and the risk of accidents. Scientists and engineers are actively using machine learning algorithms to analyze large amounts of data from satellites and other sources to predict climate change and optimize flight paths.

Artificial intelligence is also enabling improvements in the diagnostic and maintenance systems of aircraft and spacecraft. Automated monitoring systems can identify potential problems and recommend preventive measures to eliminate them. Ukrainian companies actively develop and implement innovative technologies in the aerospace industry, cooperating with well-known global partners and leading scientific centers.

The application of artificial intelligence in the aerospace industry not only contributes to technological progress, but also opens up new opportunities for

economic development, investment attraction and job creation. Government programs and initiatives are aimed at supporting the development of artificial intelligence in the aerospace industry by providing research grants and stimulating innovative projects.

One of the promising fields is the development and implementation of autonomous spacecraft capable of performing complex maneuvers on their own. Areas of research in the field of artificial intelligence in the aerospace industry include the development of algorithms for determining optimal flight trajectories, managing satellite networks, and analyzing space images automatically.

Ukraine already possesses considerable experience in the field of space research and development of space technologies, and the introduction of artificial intelligence into this field opens up new opportunities for further growth. Thanks to active development in the aerospace industry, our country maintains its place among the leading players in the world space and is able to ensure a high level of technological and scientific progress.

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DIRECTIONS OF APPLICATION OF ARTIFICIAL INTELLIGENCE IN EDUCATIONAL PROCESSES

The appearance of artificial intelligence in modern life was a breakthrough in the history of mankind. Every day we perform actions that we once thought could not be automated. The main task of artificial intelligence is to simplify life and save our time and energy by performing those processes that a computer program can do for us, but much faster and with less error in calculations. As mankind once developed calculators, so now they have been replaced by a more innovative solution to modern problems. Of course, in order to be able to use artificial intelligence correctly, it is

necessary to understand how it works from the inside, with the help of which algorithms, operations and, most importantly, logic, it is created. All this will help to get the maximum amount of information and the quality of the result from the existing implemented technologies.

The principle of operation of artificial intelligence is the same, regardless of the narrow specialization of the programs, but almost everyone now hears ChatGPT. The first launch of the program took place on November 30, 2022 in the browser version. ChatGPT is a chatbot, based on a language model, developed by the company OpenAI, which specializes in the development of artificial intelligence. The main task of the bot is to answer any of your questions, the answer is formed on the basis of a database available on the Internet. Of course, the logic of the answer is present and corresponds to a high level, since the principle of operation of artificial intelligence also includes an evolutionary skill. In simple words, with each new request that is similar in structure, the quality of the answer to the question will be better [1].

The range of questions is unlimited. You can use ChatGPT in any direction: scientific, technical, educational, etc. The chatbot will tell you how to cook pancakes according to the culinary technologies of different countries of the world, provides information about the weather in any geographical space, solves a problem in mathematics, physics, computer science for you, writes a report or an article, perhaps this report was written using ChatGPT, the chatbot can even tell you a joke that your grandfather once told you. You can list an endless number of possibilities that not only ChatGPT is capable of, but also other types of artificial intelligence.

Most often, ChatGPT is used for educational purposes, which I listed above, but I want to highlight its most useful functions: solving problems, drawing up a plan or structure of a report, highlighting the main points and terms or formulas from an outline, translating texts from other languages, since the translator will cope with this task worse than ChatGPT. There are many useful features that allow you to use the paid version of ChatGPT, the subscription of which is 20\$/month. According to Forbes, OpenAI earns approximately \$28 million/month from ChatGPT Plus. The paid version includes more useful functions that will be applied directly in professional areas, and not only in educational ones. But like anything in our world, ChatGPT has its drawbacks. For the most qualitative answer to the question, the request should be entered in English. ChatGPT is more inclined to answer theoretical questions than practical ones. It should also be noted that ChatGPT is used only as a separate

panel in your browser, while Microsoft has developed a browser with built-in artificial intelligence. Microsoft Edge has built-in AI-powered features that enhance your browsing experience, including side-by-side browsing that makes shopping easier and faster, getting detailed answers, summarizing information, or finding new inspiration for development, all without leaving the browser and switching tabs. This adds more ease of use than ChatGPT. In any case, ChatGPT is an excellent solution or simplification of many modern problems [2].

ChatGPT is not the only artificial intelligence that can be used for educational purposes. MuseNet is an artificial intelligence to help you write music, it's a very nice add-on for people who are into music. Palette – will help you paint a black and white photo, a very useful artificial intelligence for journalism students. DeepL – translates text from one language to another better than ChatGPT or a regular translator, which will be useful for students studying foreign languages. Cleanup.pictures – removes unnecessary objects from photos. Looka will create a logo for your company using the most creative approaches and tools. Tome – creates a presentation on any topic using bright images and the most pleasant graphic elements. Most of the listed artificial intelligences are free, but if you search on the Internet, you can find analogues of paid applications that will perform the work worse, but this will be enough for educational purposes, unlike scientific or professional ones.

Based on the information received, it is possible to conclude that artificial intelligence is a quality tool to improve life for many people. In my opinion, for the best use of the latest technologies, one should not only be able to use them, but also have an understanding with the help of which algorithms and tools this or that application was written, as in the example with ChatGPT, where questions should be asked in English, which will lead to improving the quality of the received answer to the question. Many students are currently using new technologies to improve and simplify the process of getting an education, which in my opinion is a good alternative and a big step in the future education system.

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ACOUSTICAL BIMATERIALS AND PROSPECTS FOR THEIR APPLICATION IN THE ROCKET INDUSTRY

The design of modern engines and modernization of aircraft structures requires up-to-date solutions in the creation and use of new materials. In this work, it is proposed to pay primary attention to the materials used in the sound insulation of the structure. The main focus of the work is to study and investigate the combination of materials in order to create a bimaterial with improved sound insulation properties.

The turbulent aerodynamic flow and high noise levels (160-170 decibels) generated by the aircraft engine cause severe vibration of the launch vehicle structure, payload, and ground launch equipment [1]. One of the primary tasks of modern rocketry is the need to reduce the acoustic pressure from the outgoing flow. Resonance-type structures or resonant sound absorbers (RSAs) are the most promising types of sound-absorbing structures that are widely used in aviation and rocketry. A simplified model of a sound absorber is a perforated panel consisting of a rigid wall and a porous material. The design of the sounding board can also be characterized as an oscillating system in which the air filling the space behind the panel plays the role of an elastic element, and the air plugs filling the panel holes act as an inertial element. As the frequency of the sound wave incident on the surface of the sound absorber approaches the natural frequency of the resonator, the air velocity in the panel openings increases dramatically. This increases the loss of sound energy caused by the action of viscous friction forces. By changing the parameters of the RSA, the resonant frequency of the absorber coincides with the fundamental frequency of the sound that hits its surface. This achieves high values of the sound absorption coefficient and a significant reduction in sound level when reflected from the surface of the RSA. One of the main disadvantages of the classical design of the RSA is the impossibility of its use for broadband noise suppression.

To achieve the required sound absorption, the priority is mostly to change the size, location, and geometric characteristics of the holes in the panel, while the characteristics of the materials are considered secondary. To ensure a vibroacoustic

environment, holes are usually selected under the spacecraft main unit at a level that corresponds to the design level so that the acoustic pressure over the entire surface of the spacecraft increases by no more than 10% at all spectral frequencies. At the same time, the spacecraft equipment located directly near the holes is checked for higher vibration levels corresponding to increased levels of acoustic load [1].

According to the results of current research, it has been found that soundproofing materials for railroad vehicles have improved properties when combined (layered) with other materials. Taking into account these observations, to solve the problem of low noise absorption and destructive vibrations, it is proposed to prioritize the creation of a material whose structure will have a large number of small externally open, air-filled and interconnected pores. The physical and mechanical properties of such a material should include: high strength, heat resistance, plasticity, adhesion, and most importantly, low density, which will ensure its lightness.

Currently, the soundproofing layer most often consists of several layers of carbon fiber glass (CFG) and polyurethane foam (PUF) of different thicknesses. The combination of these materials doubles their properties, which means they increase the level of sound insulation. A promising direction may be the creation of a bimaterial based on a composition of materials with the same properties. This method of combination will make it possible to adjust the thickness of the coating without losing the required properties, achieving its effective value while maintaining lightness and strength.

Conclusions: The creation of a bimaterial by combining different materials used in structures can contribute to a significant increase in dissipative sound wave energy losses and an increase in the sound absorption coefficient. It is no exception that a careful approach to the development of the matrix and special porous fillers of such a bimaterial will provide additional thermal insulation for the structure, reduce the level of vibrations, and increase its viability. The plasticity of the bimaterial will allow you to easily attach and place the finished panels in the process of creating the structure.

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COLLATZ'S HYPOTHESIS: FROM SIMPLICITY TO MYSTERY

In the world of mathematics, there are numerous problems that attract the attention of scientists due to their complexity and mystery. One such problem is Collatz's hypothesis, which, despite its simplicity, remains unsolved until now. Collatz's conjecture arises in the context of a sequence that appears by successively applying certain rules to positive integers.

The Collatz's hypothesis originated in 1932, when the German mathematician Lothar Collatz proposed a rather simple algorithm: he proposed to take any positive integer n . If it is even, divide it by 2; if it is odd, multiply by 3 and add 1. Thus, we get a new number. By repeating this process with a new number, we eventually converge to the number 1.

As for the result of these actions, Collatz claimed that after a few iterations the numbers would always reach 1. This is remarkable in that he was the first to point out the existence of such a simple algorithm that could lead to such a universal result. This hypothesis was called the «Collatz hypothesis» and became the subject of intensive mathematical research. Since then, it has remained one of the most interesting mysteries of mathematics.

Thus, we get a new number in the sequence. This process is repeated until the number becomes equal to 1. For example, consider in more detail the behavior of the sequence for a certain initial number n . [1]

Example: Suppose that the initial number $n = 6$.

6 is even, so we divide by 2, we get 3.

3 is odd, multiply by 3 and add 1 to get 10.

10 is even, we divide by 2, we get 5.

5 is odd, we multiply by 3 and add 1, we get 16.

16 is even, we divide by 2, we get 8.

8 is even, we divide by 2, we get 4.

4 is even, we divide by 2, we get 2.

2 is even, we divide by 2, we get 1.

So, for the initial number 6, we got the sequence: 6, 3, 10, 5, 16, 8, 4, 2, 1.

The main question that arises is whether every inputted prime number n always converges to 1 using this algorithm. For the numbers that have been tested, this is confirmed, but there is no formal proof that this is indeed true for all integers. Thus, Collatz's hypothesis remains an open problem in mathematics.

Investigation of the Collatz's hypothesis involves using of various methods, including computer algorithms, to test large sequences of numbers. Mathematicians use programs to generate sequences according to the rules of the Collatz's hypothesis and analyze their behavior.

Although a large number of numbers have been tested, no number has yet been found that does not converge to 1. This study has been performed for very large prime numbers, including numbers with sequence lengths of millions, billions, and even more.

For example, various projects such as the $3x+1$ project, where enormous computing resources were devoted to testing the Collatz's hypothesis, have not found any single contradiction to the hypothesis. Overall, this abundant empirical evidence supports the hypothesis for a large range of initial numbers.

Nevertheless, the lack of a formal proof of the Collatz's conjecture leaves it an open problem in mathematics. This attracts the attention of mathematicians all over the world, who continue to develop new research methods and try to find an analytical proof of the correctness or incorrectness of this hypothesis. Thus, Collatz's conjecture remains one of the most interesting and unsolved problems in mathematics.

I will also give these examples that demonstrate the paradoxical simplicity of Collatz's hypothesis and the complexity of its behavior. Examples of found sequence: «There are numbers for which the sequences created by the Collatz's hypothesis algorithm are very long and complex. For example, for number 27, the sequence consists of 111 steps, and for number 6171 of 261 steps» [2, 6-8].

For number 27, which at first glance may seem quite small, the sequence created by the Collatz's hypothesis algorithm consists of 111 steps. This means that the process of sequentially checking parity and performing the corresponding arithmetic operations takes a significant number of steps before the number 1 is reached. In the case of the number 6171, the sequence is even more impressive, amounting to 261 steps. This is a large number of iterations, which once again emphasizes the complexity and mystery of the behavior of the Collatz's hypothesis.

These examples indicate that even for numbers with a seemingly simple initial condition- positive integers – the Collatz’s conjecture can generate long and complex sequences. This makes it a fascinating object of study for mathematicians all over the world, who are trying to solve this riddle and find an analytical proof of its correctness or incorrectness.

Conclusion. Collatz's conjecture is one of the most interesting and unsolved problems in the world of mathematics. Although the simplicity of its formulation may seem surprising, it remains open to many different aspects of research. The use of computer algorithms made it possible to conduct a large number of empirical tests, which, however, did not find any contradiction to the hypothesis.

Despite this, the lack of a formal analytical proof leaves Collatz's hypothesis an open problem that continues to stimulate researchers in their efforts to unravel it. This mysterious hypothesis continues to attract the attention of mathematicians around the world, and solving this problem could bring new discoveries in the field of number theory and computational mathematics. Thus, Collatz's hypothesis remains an interesting object of research and a potential starting point for further mathematical discoveries.

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THE TRANSFORMATIVE POWER OF 5G TECHNOLOGIES IN TELECOMMUNICATIONS AND WIRELESS COMPUTER NETWORKS

Definition of 5G

5G is a fifth-generation mobile network standard based on the 5G/IMT-2020 standards for radio interfaces in telecommunications, the successor to the 4G network [1]. In cellular network technology, the service area is divided into small geographical areas – cells or honeycombs. All 5G wireless devices in a cell are connected to the Internet and mobile communications via radio waves, through

a local antenna. The main advantage of the new network is that it has a higher bandwidth, thus providing faster download speeds, with plans to increase the speed to 10 Gbps over time.

Due to the increased bandwidth, the new network is expected to serve not only mobile phones, but also to be used as the main Internet service provider for laptops and desktop computers, thus replacing existing Internet providers, and enabling new scenarios for IoT (Internet of things) and M2M (Machine-to-Machine) [2].

ITU-R (International Telecommunication Union) has identified three main application areas for advanced 5G capabilities. These are enhanced mobile broadband (eMBB), ultra-reliable low latency communications (URLLC), and machine-to-machine communications (mMTC). In 2020, only eMBB was deployed, while URLLC and mMTC will take several years to be implemented [3].

Enhanced mobile broadband (eMBB) uses 5G as a transition from 4G LTE mobile broadband services, with faster connections, higher bandwidth, and more capacity.

Ultra-reliable, low-latency communications (URLLC) refers to network use cases for mission-critical applications that require uninterrupted and reliable data exchange.

Massive machine-to-machine communications (mMTC) is used to connect a large number of devices, and 5G technology will connect some of the 50 billion active IoT devices [4]. Most will use less expensive Wi-Fi technology. Drones transmitting data via 4G or 5G will help in disaster relief by providing real-time data for emergency situations. Most cars will have 4G or 5G cellular connectivity for many services. Autonomous cars do not need 5G, as they should be able to operate where there is no network connection.

Standards for 5G

3GPP (the 3rd Generation Partnership Project) is a consortium of seven telecommunications standards development organizations whose main task is to create reports and specifications that define cellular telecommunications technologies, core networks and service capabilities that provide a complete description of the system for mobile telecommunications. 3GPP sets standards for 5G and defines any system that uses 5G NR (5G New Radio) software as "5G" [3].

Minimum standards are set by the ITU (International Telecommunication Union). The IMT-2020 document states that the term 5G is reserved for systems that provide download speeds of 20 GB/s.

Introduced in December 2017, the 5G New Radio (NR) laid the foundation for ultra-high download speeds, reliable low-latency connections, and connectivity for up to 1 billion new IoT devices. With its scalability, flexible waveforms, and new spectrum, 5G NR provides a solid foundation for the many different challenges envisioned by 5G.

Standalone network architecture (SA)

The first mode of network deployment is called standalone. SA means an independent 5G network. It will have both the 5G New Radio (NR) and 5G Core (5GC) standalone 5G radio interfaces. The network provides the user with full 5G capabilities. The SA network will still interoperate with the existing 4G/LTE network to ensure continuity of service between the two network generations. As shown in Figure 1.1, the 5G network can operate independently of the LTE network. At the same time, it interoperates with this network in order to cover areas not yet covered by 5G and to connect 5G users with users using 5G. Non-standard network architecture (NSA). A non-standard 5G network implies the presence of only 5G NR cells with EPCs as the core, the structure is shown in Figure 1.2. Operators will deploy 5G cells and be fully dependent on the existing LTE network for all management functions and additional services. The 5G NSA architecture operates in a master-slave structure, where the 4G access node is the master and the 5G access node is the slave [3].

Comparison of 5G and 4G technologies

Peak data transfer rate: Reaching a peak data rate of 1 gigabit per second (Gbps), 4G satisfies the requirements of most modern applications. However, LTE will not be enough to support the growing number of wireless devices being brought online every day due to the growth of the Internet of Things (IoT) and the number of applications requiring high real-time data throughput. With peak data rates of up to 20 Gbps, 5G will be able to handle these new applications without using a lot of power.

User data rate: The ultimate data rate a user receives on a 4G network can be as low as 10 Megabits per second (Mbps), which can be sufficient for most modern applications. But as IoT and mobile devices expand, higher bandwidth will be required. 5G can meet this requirement with ultimate speeds of up to 100 Mbps.

Spectral efficiency: If your goal is to optimize your system, you need to make the most of the resources at your disposal. 5G cells will be able to use the available spectrum three times more efficiently than 4G cells.

Mobility: Today, 4G can support mobile devices at speeds of up to 350 kilometers per hour (km/h). As technology advances and high-speed trains become more common, 5G has the potential to break the speed barrier by supporting mobile devices traveling at speeds up to 500 km/h.

Delay: Autonomous vehicles and vehicle-to-vehicle (V2V) communications within a dedicated vehicular ad hoc network (VANET) are still several years away from commercialization, even though many of the underlying technologies are well developed and tested. One of its main components is data latency. The latency for a VANET should be less than 100 milliseconds. Today, latency in 4G cells is up to 100 milliseconds for the control plane and 10 milliseconds for the data plane. Taken together, this is too slow to support VANETs, as any small delay in V2V communication can lead to a traffic incident or worse. 5G solves the latency problem by reducing control plane latency by 50% and data plane latency by 90%, which is 50 milliseconds and 1 millisecond, respectively.

Connection density: As the IoT market continues to grow, many more devices will be connected within a single cell. 5G can connect to 1 billion more devices per square kilometer than 4G, which supports no more than 100,000 devices per square kilometer [6].

Energy efficiency of the network: The 5G network will be 100 times more energy efficient than 4G. Thus, even with an increase in the number of wireless devices, the energy required for their consumption will decrease. This means that the carbon footprint of wireless communication networks around the world will also decrease, or at least not increase in proportion to the number of devices.

Cellular bandwidth: 5G will have the ability to manage the increase in network capacity. This is because the expected throughput, which is defined as the end-user data rate measured in megabits per second per square meter, for 5G networks will be 100 times higher than that of existing 4G networks.

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DEVELOPMENT OF A WEB APPLICATION TO MONITOR AND SUPPORT THE ACTIVITIES OF VOLUNTEER ORGANISATIONS AND FOUNDATIONS

Supporting the activities of volunteer organizations and foundations is an urgent task in the modern world, and especially in Ukraine, where the importance of volunteering and charity is constantly growing due to the military operations [1]. Volunteer organizations play an important role in promoting social and civic initiatives, but they face challenges in planning and coordinating their activities. There are a number of solutions and approaches available to support the activities of volunteer organizations and foundations, with their advantages and disadvantages, but there is a need for new and better products [2].

There are several solutions and approaches supporting the activities of volunteer organizations and foundations that exist today. The main solutions and approaches include the use of email and social media, individual platforms (websites for managing their activities, e.g. volunteermatch.org, idealist.org) and specialized systems (software developed specifically for volunteering, e.g. Better Impact, **VolunteerMark**). Existing solutions do not always meet all the needs of organizations and users; some of them are not sufficiently integrated, limited in functionality, low in availability and difficult to use [2, 5].

In order to develop an application to support volunteering, we should think about their control, so while researching ways to verify the existence of organizations and the veracity of the information they disseminate about themselves, the following evaluation criteria were identified: the code of the Unified State Register of

Enterprises and Organizations of Ukraine, address, full name and name of the legal entity [3]. This can be done with the help of ready-made software products, such as YouControl and Opendatabot [3; 4]. Instructions for their use are available on the state web application diia.data.gov.ua.

The development of an app to support and monitor volunteering meets the current needs and challenges in the volunteer sector, especially during the war in Ukraine, and can be used to improve the performance of organizations and engage more people in charitable activities. The use of modern technologies and tools will make working with the application convenient and accessible to all stakeholders.

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METHODS FOR OPTIMIZING THE LOADING AND UPDATING OF WEB PAGES USING CLOUD TECHNOLOGIES

An integral aspect of contemporary systems using cloud technologies, crucial for determining system performance and efficiency, lies in the utilization of caching methods and technologies. For systems delivering static information to end-users, technologies like Static Site Generation (SSG) [4] and Server-side Rendering (SSR) [3] are employed in constructing the client side. SSG is typically suited for pages with infrequent content changes, as modifying content on one page necessitates

the rebuilding of the entire site. To cache SSR application pages, it is recommended to utilize a multi-level cache [5] and a cache proxy server [6]. Upon a client's page request, the CDN service receives the request, and if a not-expired version of the page is available, it is delivered to the client. If the page is absent or its time-to-live has expired, the request is redirected to the cache proxy server, which possesses a larger cache size and longer time-to-live for pages. In case the cache proxy server lacks a not-expired version, the page is requested from the server, rendered, sent to the client, and updated on the cache proxy server. An illustration of such an approach is the implementation of Next.js Serverless [2].

However, due to the weak caching model employed by Next.js Serverless, delivering up-to-date data to end-users often incurs a substantial time delay, negatively impacting user interaction.

This scenario can be exemplified in a healthcare system aiming to provide users with public profiles of doctors, their practices, and reviews. Changes occur when content managers modify doctor profiles or practices, or when patients add reviews. Utilizing a Cache Proxy Server with a weak caching model partially mitigates the issue by introducing a second level of managed cache. Nevertheless, some pages may remain unchanged for extended periods, while others undergo constant updates. But the cache time-to-live is set to the same value for all pages, which leads to extra updates of rare-changed pages and delays in data delivery for frequently updated pages. This work is dedicated to addressing this challenge.

A proposed solution involves a flexible and efficient approach for generating and caching static pages using a cache proxy server. Invalidation for data updates by the cache proxy server occurs upon each change in the system's state. Similar to the Cache Proxy Server approach, we suggest rendering and storing pages in a static repository but with a strong caching model, pre-storing all possible pages in advance. Data freshness in the storage is ensured by regenerating pages with each system change affecting them. Handlers subscribed to events about changes in the system's data determine affected pages and invoke the page renderer service to update these pages in the cache proxy server. After successful rendering and saving, a request for invalidating the CDN cache is sent. This approach integrates seamlessly with event-source systems [1], dispatching events about system changes after each update.

When a user's browser sends a page retrieval request, it goes to the CDN, which fetches data from the repository and serves the pre-rendered page to the client.

This approach significantly accelerates the delivery of up-to-date data by immediately invalidating the cache after a system change. In other words, pages regularly receiving new content will be updated regularly, while those without recent changes will not undergo a **render**.

Results from the conducted experiment demonstrate that the proposed approach effectively addresses the identified problem without compromising performance compared to the Next.js Serverless approach.

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DEVELOPMENT OF TECHNOLOGIES FOR NON-ALCOHOL AND LOW-ALCOHOL BEVERAGES CONTAINING FRUIT JUICES AND VITAMIN AND MINERAL COMPLEXES

Recent research from the National Institute for Health and Care Research shows an increase in the consumption of non-alcohol and low-alcohol drinks by the adults. However, there should also be mentioned a negative trend of the high cost of such drinks being followed by the increase in health inequalities if people from poorer families can't afford them (according to the data of 2022) [4].

According to Fortune Business Insights, manufacturers are investing in low-alcohol beverages to improve taste, variety and quality, which has a positive impact on the market. A variety of innovative products from different manufacturers, including low-calorie low-alcohol fruit drinks, have attracted consumer attention [1].

In recent years, the growing consumer interest in health and wellness trends has become a key factor in the development of the non-alcohol beverage market. In addition, the negative health effects of alcoholic beverages, such as cardiovascular disease and hypertension, lead to the consumer choice of beverages with lower alcohol content, which is driving the market growth [2].

In the past, drinks were diluted with water or carbonated beverages. Carbonated drinks contain a lot of sugar and irritate the stomach walls, which can lead to gastrointestinal disorders. According to the National Institutes of Health, this is due to the effect of carbon dioxide on changes in gastrointestinal physiology through direct effects on the mucous membrane and indirect effects, mediated by the mechanical pressure exerted by the gas. The role of sugar or artificial sweeteners as factors involved in carcinogenic processes is also discussed [5].

Similar factors have led to the application of fruit juices and nectars in non-alcohol and low-alcohol drinks. This also makes such drinks less harmful, as they contain a variety of vitamins, nutrients and less sugar than fruit. In addition, non-carbonated drinks do not irritate the stomach wall, which reduces the risk of gastrointestinal disorders.

Pearl powder is made by fine grinding of fresh or salted pearls into a flour-like powder. This powder is becoming increasingly popular in the modern cosmetic world, being added to both skin care products and nutritional supplements [3].

Pearls contain essential minerals and amino acids that are important for optimal protein production and have a long history in ancient traditional medicine. Collagen peptides are among a large number of proteins involved in the stimulation of pearls. The collagen found in skin cells helps to keep your skin young, healthy and radiant. In addition to its impressive beauty benefits, pearl powder is rich in calcium, making it ideal for supporting metabolism and bone strength [3].

Due to these properties, there is a demand for adding pearl powder to dishes, as well as to non-alcohol and low-alcohol drinks, in the form of a mineral compound.

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INFUSION OF ARTIFICIAL INTELLIGENCE (AI) INTO ECONOMY: ANALYSIS OF CURRENT TRENDS

Humanity is developing every day, nothing stands still. Every year new technologies appear, and artificial intelligence is increasingly often taking part in our lives. This article delves into contemporary trends and impacts of AI on economies and societies, highlighting key developments and analyzing their implications.

Artificial intelligence (AI) is a branch of science that deals with the creation of computer systems that can perform tasks that usually require human intelligence. These systems can detect mental functions such as problem-solving, learning, speech and facial recognition, decision-making, and planning.

The main components of AI are:

1. Machine learning: This is a subset of AI that studies algorithms and models that allow computers to learn from data and experience, and to make predictions and decisions without explicit programming.
2. Deep learning: This is a sub-branch of machine learning that uses multi-layered neural networks to solve complex pattern recognition and natural language processing problems.
3. Natural language: This is a branch of AI that studies the processing methods and understanding a human language, which allows computers to interact with people through speech or writing.

4. Robotics: This is a branch of AI that explores the creation of robots and autonomous systems capable of performing physical or cognitive tasks.

5. Expert systems: These are systems that use knowledge and rules to solve problems in specific areas such as medicine, finance, or engineering.

According to a sample survey of 7,502 enterprises worldwide conducted in March 30 – April 12, 2022, by Morning Consult commissioned by IBM, the global share of enterprises that have implemented artificial intelligence is currently 35%, an increase of 4 percentage points since 2021. China and India have the highest rates of artificial intelligence deployment – 58 % and 57 %, respectively, while Canada has 28%, the UK – 26%, the USA– 25% and South Korea – 22% [3]. Of the enterprises surveyed, 28% have a holistic AI strategy, 25% focus only on limited or specific use cases, and 37% develop an AI strategy. In terms of cloud computing, 43% of businesses surveyed use private clouds, 32% hybrid or multiple clouds, 13% public clouds, and 8% local servers.

Although more and more enterprises consider the reliability of artificial intelligence to be important, most of them have not taken measures to make sure that their artificial intelligence is reliable and responsible: 74% did not reduce unintentional bias; 68% did not track performance and model changes; 61% could not explain the decision using AI; 60% did not develop an ethical AI policy.

The factors preventing the successful implementation of AI include limited skills, experience, or knowledge of AI (34 %); too high a price (29 %); lack of tools or platforms for model development (25 %); complex project or those difficult to integrate or scale (24 %); and greater data complexity. Of the businesses surveyed, two-thirds are implementing or planning to use AI to achieve their sustainability goals. In general, the impact of artificial intelligence on the economy and society is significant and continues to grow. To achieve positive results, it is necessary to balance its use with social, economic, and ethical requirements.

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WHAT WILL REPLACE Wi-Fi IN THE FUTURE?

You must admit that our lives would be different without Wi-Fi, because along with mobile communications, this is already our main way of connecting to the Internet. Yes, of course, there are those who use an Ethernet cable, but they are clearly a minority, and even fewer of those who have a modem dialogue – it's just something exotic. Well, over time, the load on Wi-Fi only increases: more and more devices, including vacuum cleaners, light bulbs, speakers and even guitars; more and more applications, more and more difficult content. You won't surprise anyone with 8k video resolution. And *Apple* also released their AR helmet, and now this direction will start to develop! And there, the appetite for traffic is not childish at all. So far Wi-Fi is doing fine in its current form; I think it will last us another 10-15 years. But what will happen when demanding users require speeds of several Gb/s, and all channels are occupied by other devices, because literally everything is connected to the Internet? Will it become even more powerful and even faster? Or has the fundamental limit already been reached, and should it be replaced by some other technology, like satellite Internet? Or maybe even a different physical principle! So, we should find out the fate of our favorite Wi-Fi, understand how to watch YouTube by connecting a smartphone directly to a satellite, analyze such unusual technologies that even Elon Musk could not dream of, and understand what awaits us in the future.

First, let's figure out how Wi-Fi works and what determines its speed? This will make it clearer where its fundamental limit may be. The throughput of a wireless connection depends on many physical parameters, but there are 3 main ones: 1) signal strength; 2) the number of spatial streams; 3) channel width. First things first:

1) the greater the signal-to-noise ratio, for simplicity we will say “signal strength,” the more gradations of this signal can be distinguished. And more bits can be transmitted at a time, for example: the Wi-Fi standard of 2000 had 64 gradations (6 Bits in one character), and modern Wi-Fi6 already offers up to 1024 gradations, that is, you can transmit as many as 10 bits at a time. This, of course, is all simplified, because everything is encoded there not only by changing the amplitude, but also the phase. But we won't go into details.

2) Spatial flows. You've probably seen eight-antenna spider routers that have eight antennas around the perimeter; this is the main element of MIMO technology – multiple input/multiple output, which allows you to pull off this trick: different data can be sent from different antennas at the same frequency. Yes, they all get mixed up and it turns out to be a “porridge” of radio waves, in which nothing can be made out. But if the receiving device also has 8 antennas, then each signal can be restored using software from this “mess”. This is possible because the waves from each antenna travel a slightly different path. There they are reflected from something and come, one might say not at the same time. This, of course, requires a lot of computing power, but we get a fair increase in speed: 8 antennas means the Internet has become 8 times faster.

3) Wi-Fi channel width does not work at the same frequency. Its signal is evenly spread over the provided channel, only now this is done not by jumps in purity, but by using several subcarriers at close frequencies, over which data is transmitted simultaneously. They are arranged overlapping, but in such a clever way that in areas of overlap they are in antiphase, cancelled, and do not interfere with each other and others under the carrier, therefore they are called orthogonal. So, the wider the channel, the more subcarriers fit into it and the more information is transmitted per second. The logic here is also simple – the relationship is linear. So, what can be done to make Wi-Fi speed even faster, and it's not about cutting off the neighbors' electricity, but how to improve the standard itself?

Right now, the new Wi-Fi7 is coming to replace the current Wi-Fi6 and 6E, so it's convenient to consider this example. You can increase the number of signal gradations. In Wi-Fi7 there are four times as many, up to 4096, which is 12 bits at a time, and why can't we go on like this indefinitely? The fact is that for this you need a high signal-to-noise ratio, and this either comes closer to the router, or increases the power of the radiation itself. But no one wants to carry a microwave in their pocket, so you can't increase speed much like that. You can increase the number of spatial streams (Wi-Fi7 supports up to 16 of them), and if you can use all 16 in laptops, well, most likely it will be possible, but with smartphones it's more difficult, because there are already a lot of antennas for mobile communications (Bluetooth, GPS). And even if you manage to place about 20 of them inside, then do not forget that the threads are separated by software, and this is not a bad load on the hardware and a drawdown in terms of autonomy. So, of course, it is possible to increase

the number of spatial streams, but this is a problem with an asterisk. And the width of the channel remains. In the first versions of Wi-Fi there were 14 of them at 20 MHz. But so that they do not overlap, only three can be used. Then they added another 25 channels in the 5 GHz range and allowed them to be combined in groups of four. But then there were only six such wide channels left, so, not too many. The Wi-Fi 6E specification added another range – 6 GHz with sixty channels, and in Wi-Fi7 they can be combined in 16 pieces. In general, there are a lot of numbers, so let's just summarize: the maximum channel width will be 320 MHz, it is not clear what to compare this figure with, for example: 1600 FM radio stations fit into this range. In general, this is really a lot, and if all other Wi-Fi7 parameters are also taken to the maximum, then it will be capable of reaching speeds of 46 gigabytes per second. For comparison, this is the same speed as very good SSD drives, just without wires. Of course, such figures are only possible under ideal conditions; on powerful equipment and in typical scenarios, the speed will be lower. Because not all frequencies are available in all countries, and there may be many subscribers, and they will share this speed among themselves. But anyway, this Wi-Fi will most likely be enough for us for 10-20 years [1].

But what happens next? There is a difficult way: increase the number of spatial streams, the number of signal gradations, you can even place subcarriers closer. Then they are called non-orthogonal, and to separate them requires even more calculations. But there is an easy way: just add even more channels. There are many free windows at frequencies of tens of gigahertz. And most likely, they will be gradually occupied by new Wi-Fi specifications. So, at least 100, at least 200 gigabits per second, I think, will not be any particular problem. Yes, the range will suffer a little, but just put not one router in the apartment, but several, and the problem is solved. So the potential of Wi-Fi technology is extremely impressive, and we are definitely with it for a long time.

Let's imagine that in the future we won't need Wi-Fi at all, and it will be completely replaced by mobile communications. After all, now with 4G, we don't look for Wi-Fi in cafes. And when 5G becomes widespread, will we need all sorts of home routers and access points? It's hard to say. On the one hand, wireless traffic is now quite organically distributed between mobile communications and Wi-Fi. And if one disappears, the other is unlikely to bring in a flow of new connections. At this stage, for sure. In addition, if Wi-Fi allows you to create many networks on

one channel that do not interfere with each other, because its range is short, then cell towers have much greater coverage, and if the channel has already been occupied, that's it. Wait for the rest to be released. But on the other hand, new generations of networks have ever wider channels, more and more complex modulation and, accordingly, the frequency range is used more efficiently. And with beamforming technology, many users can sit on the same channel at the same time without disturbing each other. So there are all the prerequisites that after some time we will not have routers at home. It is not yet clear exactly, but such a scenario is quite reasonable. In this case, we need to talk about the development of the mobile Internet. And here, too, everything is interesting, because there are already so many towers. And what can be done to make them more accessible? Of course, raise it higher.

This is what Google's "*Loon*" project did: providing the Internet in rural and remote areas, where direct transmitting equipment was placed on high-altitude pseudo-satellites. What are these pseudo-satellites? These are unmanned aircraft or balloons that fly for a long time without landing in autonomous mode, at an altitude of 20 to 50 km. Specifically, in this project, geostationary balloon pseudo-satellites were used. Giant fifteen-meter balloons filled with helium, hanging over one point above the ground. The equipment on them was powered by a 100 W solar panel, which also charged the battery for night work. The balls had to exchange information with each other using lasers, and the service life of each was more than 200 days. The most interesting thing was how it was proposed to keep the balls in place, because they were not tied to a string. It is known that at different altitudes the wind blows with different strengths, and often in different directions. The balls are equipped with a system capable of changing their volume, that is, buoyancy, and so they can rise and fall, just like a fish squeezing and unclenching its swim bladder. Therefore, using artificial intelligence, deftly maneuvering between layers with the desired wind, you can drift near one point. So, perhaps, soon all cellular towers will disappear in cities and beyond, and their place will be taken by "communication balloons" [2].

Pseudo-satellites are good, of course, they are not expensive to develop and maintain. But if we want global coverage, we need real satellites. I think everyone has heard about Starlink, and this is not surprising, because it is a very promising technology. But there is one nuance here – you cannot connect your phone to

the satellite without a special terminal to receive the signal. And it's necessary to say about a method that allows you to connect a smartphone like yours directly to a satellite without any modification or terminal for receiving the signal. Yes, and this is already possible. Let's figure out what's the problem with connecting a regular phone directly to a satellite? It's all about the size of the phased array antenna, the larger it is, the more focused the beam it can produce, and accordingly send, this produces a more powerful signal per unit area and receives weaker ones. Because the grille is focused at a small angle and does not perceive all the noise around it, it's as if you are talking to someone through a long pipe, which just cuts off everything unnecessary. So, if the area of the antenna array is several tens of square meters, this is enough to receive a weak signal from mobile phones at an altitude of 500-600 km. And it turns out that if you launch the right satellites, your mobile phone automatically turns into a satellite phone. And this is not a dry theory; several companies are already developing satellite communications for ordinary, unmodified phones. "*The Linklobal project*" has already demonstrated a successful voice call from a phone directly via satellite at regular GSM frequencies. And it begins to deploy an orbital constellation for global coverage. The interesting thing is that in addition to physical problems such as: Doppler frequency shift, they had to solve difficulties with the communication protocol, because GSM phones are disconnected from towers that are further than 35 km. And the satellite has to pretend that it is a stationary tower at a distance of 20 km [3]. In June 2023, AST SpaceMobile announced direct data transfer from phone to satellite via LTE at a speed of 10 Mbit/s. This was achieved due to an antenna array measuring 64 m², which was unfolded in orbit. And although this is only testing for now, it is proof that it is possible to distribute the Internet from space, and that there are no longer any physical and technical limitations [4].

Well, don't you think it's cool that we are witnessing how rapidly the world of telecommunications is developing! Just some 15 years ago, Wi-Fi had just appeared in phones. And we, of course, had to send something heavy through a wire. And what will happen in 15 years is even difficult to imagine. In general, we are witnessing a great telecommunications leap that is pushing us into the future!

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MODERN SCIENTIFIC PROBLEMS OF CYBER SECURITY

The results of war in cyberspace are decisive for the general development of combat operations in modern confrontations. A cyber attack and cyber intrusion can cause massive damage or significant disruption to critical information infrastructure at any level. This applies primarily to cyberattacks on energy, transport, and military infrastructure facilities, during which facilities for supply management, logistics management, etc. are disabled.

We have been observing such attacks throughout the entire period of confrontation with the **Russian Federation**, starting in 2014. Everyone remembers how at the end of 2015 there were cyber attacks on infrastructure facilities of the energy sector in the Carpathian region and in the Lviv region, as a result of which entire regions remained without electricity and it took some time to restore the network. On the night of the large-scale military invasion of the **Russian Federation** on the territory of Ukraine on February 24, 2022, a massive attack was carried out on Ukrainian networks, but thanks to cyber protection measures taken in advance, its consequences were minimized. Recently, there have been prolonged attacks on banking institutions, which did cause damage, but due to the rapid response of cyber defense systems, these losses were not as significant as they could have been. Attacks were also observed on the websites of state institutions and central authorities, as a result of which attackers placed provocative advertisements on them or disabled them with the help of so-called DDoS attacks.

The main means of a cyberattack are related to the use of malicious code and attempts to intrude using system vulnerabilities. Malicious code most often enters the system due to violations of cyber hygiene by users – switching to dangerous sites, opening attachments in suspicious e-mails, and therefore the degree of success of the intrusion is determined by the quality of the protection system.

In cyber security, five key activities can be distinguished for resisting an intrusion:

- 1) attack detection, i.e. recording the fact of abnormal network operation;
- 2) identification of the attack, which consists in the precise classification of its type;
- 3) defense against an attack, covering a sequence of steps aimed at countering an intrusion;
- 4) response in case of identification of the attacker;
- 5) elimination of the consequences of the attack and recovery of information using data recovery and preservation algorithms.

Each of these activities is a separate direction in engineering and applied sciences. In addition, in the process of preparing for possible attacks, two key questions should be answered:

- 1) how resistant is the system to intrusions and capable of countering cyber attacks?
- 2) what is the quality of the system in relation to the presence of vulnerabilities in software or hardware?

If the first question concerns the effectiveness of the intrusion detection system in the process of interaction with attacks, the second concerns the quality of testing and verification of the system at the stage of its creation.

Modern cyber security technologies actively use both engineering methods and the latest advances in science, such as artificial intelligence methods and formal algebraic methods. In particular, an algebraic approach is being actively implemented, which opens up opportunities for the most accurate analysis of software and hardware system models in order to determine resistance to intrusions and the absence of vulnerable behavior. Another approach is the use of deep learning neural networks built into the Intrusion Detection System (IDS).

Modern intrusion detection systems.

An intrusion can be defined as any type of unauthorized activity that causes damage to an information system. Modern intrusion detection systems provide a significant improvement in protection features compared to previous cyber security tools such as network firewall, virtual private network and notification encryption. Such systems perform two main functions. First, the system detects unwanted behavior as an anomaly, even though it may not be a true intrusion (false detection). Secondly, the system collects data, analyzes actions in network protocols and

compares them with so-called signatures containing data on possible attacks. According to these two functions, two main types of detection systems are distinguished, although in fact there are many varieties that combine these two functions.

Signatures of known attacks exist in the database of the detection system in various specifications, for example, in the form of rules over protocol parameters in the form of if-then-else. If a rule contained in the signature database that qualifies as a certain type of intrusion is met for protocol parameters, then an alarm is triggered.

There are certain difficulties in detecting intrusions that appear over a period of time and contain signs of intrusion in different packets of protocol traffic. To overcome these complications, some systems use the representation of signatures of finite automata, in particular as implemented in the developments of the University of Michigan. At National Taiwan University, the systems use language string templates or semantic conditions. However, invasions stretched over time are not always detected.

It is believed that the comparison with signatures for such intrusion detection systems is a fairly effective method that gives good results in detecting already known attacks, but in the case of zero-day attacks, that is, previously unknown, they are powerless.

Systems based on anomaly detection can detect previously unknown intrusions such as deviations from the normal behavior of network activity. Several varieties are distinguished among these systems. Statistics-based detection systems model the distribution of events for normal behavior, then detect low-probability events and flag them as potential intrusions.

Knowledge-based systems use facts about the normal operation of a network protocol and classify any deviation as an intrusion. The disadvantage of this method is that it is very difficult to gather all the facts about the normal operation of the system, even with the use of formalizing the operation of the protocol with the help of formal structures. More modern systems based on anomaly detection often use machine learning. They demonstrate better accuracy on both known attacks and zero-day intrusions. In addition, such systems, if trained on the right data, can classify known attacks, although other problems arise. Machine learning is the process of extracting knowledge from large amounts of data in order to recognize or predict behavior. Knowledge is formed in the form of a classification model provided by a certain generation algorithm. Clustering algorithms, generation of neural networks, genetic

algorithms, decision trees and the k-nearest neighbors method are used to build models of network behavior classification.

Today, neural networks are the main model in intrusion detection systems. Detection of vulnerabilities in software and hardware systems.

Software vulnerabilities are the main target of attacks that can damage the operation and reputation of millions of systems worldwide, as well as lead to huge financial losses. Therefore, identifying vulnerabilities in both software and hardware is one of the main tasks of cyber security.

Vulnerability detection tools have long been used in software development systems, as well as as separate detection systems. Vulnerability detection is considered both at the level of source code in a high-level programming language and at the level of binary code. Software development systems offer detection of vulnerabilities based on erroneous code fragments, which makes it possible to build a so-called exploit. An exploit is a behavioral script and associated data that an attacker can use to perform an intrusion to destroy a system, compromise its identity, or seize control of a system.

The main disadvantages of using program code fragments are that this method does not guarantee the absence of other vulnerabilities, that is, a vulnerability may exist, for example, in the libraries used by the program, and analysis at the source code level will not detect it. In particular, this concerns the incorrect use of libraries. In addition, the detection of vulnerable code fragments can be false, meaning that the vulnerability found will never work when the programs are executed.

Another, more advanced means of representing vulnerabilities is their formal templates. At the same time, code modeling methods are used, although it is believed that these methods provide rather low coverage.

Both approaches use vulnerability detection systems in binary code. In this case, the problem of adequately presenting vulnerabilities at the level of binary code, which comes from the programming language in which the program is written, arises.

If vulnerabilities are identified, follow-up actions are important. If at the level of programming in high-level languages it is suggested to replace erroneous fragments with safer ones, then at the level of binary code the application of patching technology is considered. On the one hand, automatic correction can lead to unpredictable behavior of the program, but on the other hand, it can be correct if the correction is

equivalent, that is, it does not change the behavior of the program, which must be verified by formal methods.

Neural networks and intrusion detection.

Algebraic methods are used to test the vulnerability finding properties of a system that can be invaded. At the same time, the complexity of the calculations can be quite high and the verification will take a lot of time. However, when detecting attacks during system operation, time is critical, and the algebraic approach may prove ineffective.

To quickly detect an attack in a network environment, deep neuron networks are used, which are able to classify the behavior of the network protocol during an intrusion as abnormal. More advanced neural systems determine the type of attack according to its classification model. As mentioned above, neural networks are used in intrusion detection systems (IDS). Neural systems are built using machine learning or training on certain data sets that are collected in the process of observing the behavior of network protocols. The easiest and fastest way to detect attacks in real time is to identify anomalous behavior that does not correspond to normal protocol actions. However, false detections are possible, since deviations from normal behavior can occur not only due to intrusion into the system, but also due to improper use of resources, user errors, or programs operating in the environment. Therefore, preference is given to systems that are able to classify the causes of the anomaly. However, such systems will not be able to detect an attack for which no training set has been created.

Therefore, considerable attention is paid to data sets intended for training. Today, there are several open data sets containing the behavior of network protocols, but there are certain difficulties with their use. One of the main problems is that the amount of data is insufficient to accurately classify certain attacks. Data may be redundant or noisy. At the same time, there may be an imbalance in the distribution of model classes. Since behavior classification time is critical, deep learning neural networks with minimal number of layers were considered to reduce computation. Other types of networks were also used to improve efficiency: convolutional and recurrent neural networks.

Conclusions.

Therefore, the use of artificial intelligence methods such as machine learning and algebraic deductive methods are more effective in solving cybersecurity

problems than engineering solutions based on viral and specific behavioral signatures and quarantine "sandboxes".

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AN EXACT GPU-ACCELERATED ALGORITHM FOR THE SUBSET SUM PROBLEM

The Subset Sum Problem is a well-known NP-complete problem that asks whether there exists a subset of a given set of integers that sums up to a given target value. This problem has many applications in cryptography, combinatorics, and optimization. However, finding an exact solution for large instances of the problem is computationally challenging, as the number of possible subsets grows exponentially with the size of the input set.

An exact algorithm for solving the Subset Sum Problem with acceleration on GPU is proposed in this work. The algorithm is based on backtracking [1, p. 231], a general technique that explores the search space of possible solutions by recursively branching on each element of the input set. Pruning is utilized to restrict the exploration.

When the current partial sum surpasses the target value, the path is deemed infeasible, and the algorithm backtracks to explore alternative branches. Furthermore, if the sum of the current subset and the maximum achievable sum remaining falls below the target, the branch is abandoned to prevent exhaustive exploration of unproductive paths. These pruning rules allow the elimination of large portions of the search space that cannot contain a feasible solution.

The algorithm consists of two phases: a breadth-first search (BFS) phase on CPU and a depth-first search (DFS) phase on GPU. In the BFS phase, the algorithm starts from the empty subset and expands it by adding one element at a time, following the order of the input set. The intermediate subsets and their sums are stored in a queue, and the pruning rules are applied to discard infeasible subsets. The BFS phase stops when a predefined depth limit is reached, or when the queue is empty, or when a solution is found.

In the DFS phase, the data from the queue is transferred to the GPU memory, and a kernel with multiple threads is launched. Each thread performs a DFS on a different subtree of the search space, starting from a different subset in the queue. The DFS phase follows the same logic as the BFS phase, but it uses a stack instead of a queue to store the intermediate subsets. The DFS phase terminates when all the threads finish their work, or when a solution is found.

The proposed algorithm was implemented in C# programming language using the ILGPU library, which provides a high-level abstraction for GPU programming.

The proposed algorithm is an effective method for solving the Subset Sum Problem with acceleration on GPU. The algorithm exploits the parallelism and the memory hierarchy of the GPU architecture, and reduces the search space by applying pruning rules. The algorithm can be extended to solve other NP-complete problems that can be formulated as subset problems, such as the knapsack problem, the set cover problem, and the partition problem.

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ON MIGRATION OF LEGACY HOSPITAL INFORMATION SYSTEM TO DOMAIN-DRIVEN ARCHITECTURE

Year-to-year the complexity of software keeps growing. Today's business requires more than just an information system that responds the immediate needs. It requires more flexible, maintainable, and testable IT infrastructure able to meet the business challenges. Multi-layered and service-oriented [2] software architectures, Domain-driven Design (DDD) approach with its modifications [3], event-driven architecture can be seen as variants to handle the challenges. But the implementing of such approaches results in dozens of huge projects with hundreds and even thousands of classes and sophisticated testing infrastructure necessary to support continuous refactoring of the system. It complicates the development process which results in time and effort expenses required to realize, test, and implement the system into organization.

Modernizing legacy systems is one of the most challenging problems for developers often face when engineering information systems. Thus, changing requirements of the system environment, emerging new technologies and business models re-engineering, on one hand, and functionality, performance, usability, maintainability issues of the legacy systems, on the other, force the companies to start the migration process. All these statements can be fully attributed to modern hospital information systems. Health information systems (HIS) represent an essential part of the infrastructure for the delivery of good health care. And at this point the question of choosing the strategy of migration arises.

Forward or database first migration provides to migrate unchanged legacy applications forward onto a modern DBMS and then migrates the applications. The profit of the approach seemed to be achieving better data operations processing and data analysis performance, safety and relevancy using modern DBMS facilities.

While the database migration step could be made iteratively, it seems not very effective because it will complicate the cut-over as well as the gateway that would have to mediate between the diminishing legacy database and the growing target database.

This approach can only be applied to a legacy software where the Data-access layer is decoupled from the upper layer by the interfaces (in case when this layer ever exists in legacy software and separated from business logic layer).

The Reverse Migration or Database Last approach provides to migrate target applications in the reverse direction, back onto the legacy database until it is subsequently migrated. This method permits more time to deal with the database migration. It involves a reverse database gateway that facilitates a Chicken Little migration of the applications and their interfaces before the Big Bang database migration. The reverse database gateway converts all calls to the modern DBMS from target applications and maps them into calls to the legacy database service. It must also capture, translate, and direct responses from the legacy database service to the appropriate modules (means notifications).

Iteratively, it supports more target application modules until all are supported, thereby completely encapsulating the legacy database service. It contracts as the target applications are migrated to access the target database directly.

The advantages of the approach are as follows. Firstly, this approach can be used for semi-decomposable and even for non-decomposable legacy applications, while Forward Migration one cannot. Secondly, this approach is more commercially acceptable than the Forward Migration approach because it allows legacy application to operate uninterrupted while new application is being redeveloped.

The next important approach is the Iterative method. It implies that one component at a time is reengineered. Thus, the legacy system gradually evolves over a period.

The methodology enables simultaneous operations of the reengineered system and the components of the legacy system. The components of the reengineered system access either the legacy database or the new database, based upon the location of the actual data to be accessed.

Prototyping and piloting are recommended as the basic strategies to test potential solutions and validate system integrity, performance, and acceptance by users.

Prototypes should be meaningful and focused on evaluating user interfaces and operational usage scenarios. Pilot implementations on a small scale are suggested to validate migration efforts. Pilot approaches are particularly useful for gathering user input and achieving user acceptance.

Given the large volume of work on migrating legacy systems and improvement of their understanding, approaches are divided into two groups: modernization and replacement **Ones**. Modernization, in turn, is classified based on two common strategies. On the one hand, there is the strategy of encapsulating inherited logic using a modern software layer, which is called wrapping, black boxing, or direct migration. On the other hand, there are «white box» strategies or indirect migrations that completely redefine the outdated system using reengineering principles.

In [1], the authors offer a «black box» method based on encapsulation, allowing interactive features of outdated systems to be made available as web services.

Thus, the migration approach should combine the properties of the Reverse and Iterative methods, using pilot deployment, as well as can work on the old database, create replicas, and connect new services to them (after implementing the pilots).

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ADVANTAGES AND DISADVANTAGES OF ARTIFICIAL INTELLIGENCE

In recent years, artificial intelligence has been on everyone's lips, especially after the launch of such services as ChatGPT and Midjourney. Some admire the possibilities that this technology provides, while others, on the contrary, see neural networks as dangerous. So what are the advantages and disadvantages of artificial intelligence [2]?

Artificial intelligence (AI) is the intelligence of machines or software, as opposed to the intelligence of other living beings, primarily of humans. It is a field of study in computer science that develops and studies intelligent machines. Such machines may be called AIs.

AI technology is widely used throughout industry, government, and science. Some high-profile applications are: advanced web search engines (e.g., Google Search), recommendation systems (used by YouTube, Amazon, and Netflix), interacting via human speech (such as Google Assistant, Siri, and Alexa), self-driving cars, generative and creative tools (ChatGPT and AI art), and superhuman play and analysis in strategy games (such as chess and Go) [3].

Alan Turing was the first person to conduct substantial research in the field that he called machine intelligence. Artificial intelligence was founded as an academic discipline in 1956. The field went through multiple cycles of optimism followed by disappointment and loss of funding. Funding and interest vastly increased after 2012 when deep learning surpassed all previous AI techniques, and after 2017 with the transformer architecture. This led to the AI spring of the early 2020s, with companies, universities, and laboratories overwhelmingly based in the United States significant advances in artificial intelligence.

In essence, artificial intelligence can be considered any program or device capable of performing tasks instead of a person. Although artificial intelligence has many advantages, it also has disadvantages [2].

Machines enhanced by Artificial Intelligence will not replace humans altogether but will work side by side with them as assistive analytical tools, performance enhancers and cost reducers.

Artificial Intelligence will eventually reduce the cost of living and will serve as a tool for creativity, meaning it will enable artists, scientists, musicians, writers, CEOs and M&A experts to be even more creative and more effective [4].

Both deep learning and machine learning are sub-fields of artificial intelligence, and deep learning is a sub-field of machine learning.

Deep learning is comprised of neural networks. The “deep” in deep learning refers to a neural network comprised of more than three layers – which would be inclusive of the inputs and the output – which can be considered a deep learning algorithm. The way in which deep learning and machine learning differ is in how each algorithm learns. Deep learning automates much of the feature extraction piece of the process, eliminating some of the manual human intervention required and enabling the use of larger data sets. Enterprise-grade GPUs will help power through the mathematically intensive workloads required for deep learning and machine learning.

"Deep" machine learning can leverage labeled datasets, also known as supervised learning, to inform its algorithm – but it can also conduct unsupervised learning using raw content – and it can automatically determine the hierarchy of features which distinguish different categories of data from one another. Unlike machine learning, it doesn't require human intervention to process data, enabling us to scale machine learning in more interesting ways [5].

Deep learning uses several layers of neurons between the network's inputs and outputs. The multiple layers can progressively extract higher-level features from the raw input. For example, in image processing, lower layers may identify edges, while higher layers may identify the concepts relevant.

Deep learning has profoundly improved the performance of programs in many important subfields of artificial intelligence, including computer vision, speech recognition, natural language processing, image classification and others. The reason that deep learning performs so well in so many applications is not known as of 2023. The sudden success of deep learning in 2012-2015 did not occur because of some new discovery or theoretical breakthrough but because of two factors: the incredible increase in computer power (including the hundred-fold increase in speed by switching to GPUs) and the availability of vast amounts of training data, especially the giant curated datasets used for benchmark testing, such as ImageNet [3].

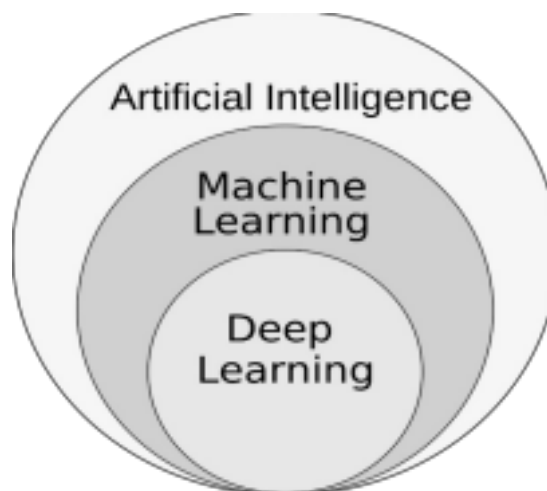


Fig. 1. Machine learning as a subset of Artificial Intelligence [3]

- Advantages of AI:

1. Reduction of errors due to the human factor. One of the main advantages of artificial intelligence is that it can significantly reduce the number of errors and

increase the accuracy of the result when performing various tasks. Decisions made by AI at each stage are determined by previously collected information and a certain set of algorithms.

2. Reducing the level of risk. Another advantage of AI is that it can be used to minimize risk, allowing robots and artificial intelligence to perform dangerous tasks for humans, be it defuse a bomb, travel into space, or explore the deepest parts of the oceans.

3. Digital assistants. Some technologically advanced companies already today interact with their customers with the help of digital assistants based on artificial intelligence, reducing their staff [2].

4. 24/7 availability. People are maximally productive only 3-4 hours a day. Also, everyone needs breaks, weekends, and vacations to maintain work-life balance. But artificial intelligence, unlike a person, is able to work endlessly without interruptions.

5. New inventions. AI has given a powerful impetus to numerous innovations, many of which will help people solve complex problems.

6. Use in medicine. AI has also made a significant contribution to the development of modern medicine – from increasing the efficiency and accuracy of diagnosis and treatment to creating new drugs and conducting clinical trials.

7. Unbiased decisions. Whether we like it or not, we have to admit that people are driven by emotions to one degree or another.

Disadvantages of AI:

1. High costs. Creating a machine capable of imitating human intelligence requires a lot of work and multimillion-dollar investments. The development of such technologies requires a lot of time and resources.

2. Lack of creativity. Another big disadvantage of AI is that it is impossible to teach the system to think outside the box. Yes, artificial intelligence is capable of self learning based on previously received data and past experience, but it is completely devoid of creative thinking.

3. Risk of rising unemployment. One of the main dangers of artificial intelligence is the reduction of jobs. Robots have already begun to replace people in various positions.

4. AI can make people lazier. As we said earlier, AI-based systems are

capable of automating most tedious and monotonous tasks. Because with the advent of modern technology, we don't need to memorize a lot of information.

5. Cyber attacks. Increasing use of AI in educational institutions may increase threats from cyberattacks and leaks of students' personal information. Protecting confidential data is becoming an important issue [1].

Artificial intelligence is an important part of our lives. It is used in science, education, medicine, remote control of robots, remote sensing of the Earth, and electronic commerce. However, AI was created by humans, and they must bear great responsibility for their work. These intelligent machines will perform “human actions” now and in the future.

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RELEVANCE OF UPGRADING THE TACTICAL AND TECHNICAL CHARACTERISTICS OF THE MEANS OF DEFEAT

The creation of modern and competitive means of defeat forces us to look for new approaches and develop new design solutions using modern special materials. These should include titanium, aluminum, aluminum and titanium alloys, special steels, as well as non-metals in the form of binding materials, reinforcing fillers, composite materials, rubber, rubber engineering products, thin-layer thermal insulation coatings, sealants, adhesives, ozone-safe degreasers, thin-layer thermal insulation coatings, etc. [1, p.3]. A special place in this list is occupied by rubber and products based on them – rubber engineering products.

In many cases, rubber engineering products became the forming source of the most modern objects of aviation, rocket and space technology and their constituent parts, new technologies and systems [2, p.1].

Means of defeat in their design, as a rule, contain rocket engines on a solid propellant as a propulsion system for delivering a warhead to a given point. In addition to high strength and high longitudinal stability under the influence of high temperature when burning solid mixed fuel with a temperature of up to 3500⁰C, the rocket engines on a solid propellant body must have an internal heat-resistant covering, since the strength characteristics of the body material are significantly reduced when exposed to high temperatures. And this limits the increase in the mass of the warhead and its delivery range.

It is obvious that the material for the internal heat-resistant covering must be a material with appropriate technical properties, in particular: low density and coefficient of thermal conductivity, satisfactory strength and technological properties, ability to connection without delamination with other structural materials in the multi-layer structure of the rocket engines on a solid propellant with the possibility of its production in Ukraine.

Such a structural material can be rubber of the appropriate composition, with a density of the order of 1.1-1.3 g/cm³, which is lighter than steel and aluminum by more than 6 and 2 times, respectively. It's worth noting, that rubber has satisfactory technological and other properties according to the appropriate technologies and is widely used for various rubber engineering products manufacturing, including reinforced and coatings of objects of rocket and space, aviation and other equipment. Thus, increasing the tactical and technical characteristics of means of defeat due to the usage of internal heat-resistant covering is possible by using materials, in particular rubber, along with traditional structural materials.

The implementation of this research direction can become a significant contribution to the further development of the Ukrainian economy, both during the legal regime of martial law and after its termination.

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DEVELOPMENT OF SMART CITIES IN UKRAINE

Technology development does not stand still. Every year, the world learns about new discoveries in various fields, ranging from new materials with improved capabilities and the development of electric vehicles to artificial intelligence. These and many other inventions can make people's lives easier, improve their health and productivity in one way or another. In this regard, it is appropriate to recall a quote by Eric Schmidt: «The development of technology in cities is not only about innovation, but also about changing the quality of people's lives for the better» [4].

While searching for information, I noticed that different cities have added a different number of interesting inventions and that technologies differ from city to city. I decided to choose the city of Dnipro for the study. First of all, I analyzed the latest technological implementations. Some of them were funded and initiated by private enterprises, and some by the city. The former include electric scooter rental services and the installation of self-service cash registers, order tracking, and payment in cafes by QR code [3]. The latter include public transport GPS tracking, smart bus stops, and free technological restrooms [2].

Each innovation has both positive and negative aspects, but they all make life easier in the city. And different cities have their own interesting technologies [1]. However, unfortunately, the presence of these technologies in one city does not mean that another city will also have this technology.

For example, the technology of buying a ticket in public minibuses through the terminal is available in Kyiv, but the city of Dnipro only has payment by card in electric transport via QR code [1, 3].

Therefore, the availability of technology does not mean that it will be implemented in most cities. Perhaps, the lack in general exchange of experience in integrating new systems into society or the low payback of such introductions, as well as the high cost of such introductions slow down the process of disseminating new technological solutions [4]. Nevertheless, every step towards digitalization and improving the standard of living in the city through convenient innovations allows people to develop together with the city, which undoubtedly has a positive impact

on overall well-being and productivity; this, in my opinion, should be a higher priority than the value of new technologies.

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POSSIBILITIES OF INCREASE IN ENERGY EFFICIENCY LRE WITH THE HELP OF ADDITIVES

Rocket fuel for liquid engines is usually divided by the number of components. Currently, two-component fuels are undeniably popular. These two separate components (oxidizer, fuel), which are stored in different tanks and fed separately to the combustion chamber, where they are mixed.

Today, the world is developing a new fuel called «acetam» (a 50:50 solution of acetylene in ammonia). The greatest effect from the use of this fuel can be achieved by using it on booster units (BU). Ballistic calculations show that for medium-class LVs, replacing the oxy-kerosene RB engine with an oxy-acetate engine will increase the mass of the payload by 30-40 %. Therefore, the use of acetam, which significantly increases the energy of existing means of removal, gives great savings.

Since oxy-acetamide engines are close to oxy-kerosene engines, it is possible to create modernized aircraft on the basis of existing launch vehicles. They will have the energy capabilities of launch vehicles with oxygen-hydrogen booster units, but at the same time they are easier to operate and much less expensive in terms of launch services, due to the reduction of fuel tanks and therefore the size of the launch vehicle.

Various additives can be added to increase energy efficiency and simplify fuel exploitation. These include:

- stabilizers (etilcentralit $C_{17}H_{20}ON_2$, diphenylamine $C_{12}H_{11}N$) – to increase the chemical stability of fuel during storage;
- phlegmatisers (magnesium oxide) – to reduce explosion hazard;
- energy (dinitrotoluene, nitroguanidine) – to increase energy characteristics;
- dyes;
- rosin – to increase hygroscopicity;
- binders – for SPE, they act as a fuel-binding agent. These are heavy oil products (asphalt, bitumen); modern polymers (polyester, phenolic and epoxy resins); plastics (polyamide, polyvinyl chloride, polyisobutylene, etc.); rubbers (polybutadiene, polysulfide, polyurethane, polyisobutylene, butadiene styrene) and other substances.

Currently, polyisobutylene-based additives to oxygen-gas fuel are actively being developed. The presence of a polymer additive in the LRD fuel component allows to reduce the power consumption of the turbopump turbine due to an increase in efficiency and an improvement in the cavitation characteristics of the pumps of the supply units. Also, their presence reduces the required power of the turbine by reducing pressure losses in the path of regenerative cooling of the engine chamber. At the same time, in engines with afterburning of generator gas, a decrease in the specific power of the turbine is achieved, which increases reliability and provides the possibility of thrust forcing. In engines without afterburning, the consumption of the working medium for the turbine drive is reduced, which improves the design and ballistic parameters of the LV in general.

But the obvious advantages of the properties of fuel with a polymer additive, which allow to reduce water losses in the LRD tracts, on the one hand, and such phenomena that accompany the flow of diluted polymer solutions, such as the reduction of convective heat exchange and the deterioration of liquid atomization in the nozzles, on the other hand, constitute a contradiction and prevent practical the use of additives in rocket and space technology. However, this contradiction can be partially removed. If we take into account the property of a significant weakening of the influence of the dissolved polymer on the characteristics of the turbulent flow in long channels of small cross-section, at high Reynolds numbers and high liquid temperature – the so-called degradation of the polymer solution.

Various physical processes take place in the hydraulic tracts of LPE (centrifugal pumps, regenerative cooling tracts, nozzles, etc.). Among them are turbulent flows in channels of different geometry and flow kinematics, intensive

convective heat exchange, cavitation, spraying processes. The intensity of these processes in the tracts varies within very wide limits. As the fuel component with a polymer additive moves from the engine inlet to the combustion chamber mixing head due to hydrodynamic and thermal effects, specific properties of diluted polymer solutions, including the above-mentioned properties, are degraded, which can negatively affect the operation of the LPE.

Thus, as before, the question of the effect of the polymer additive on the completeness of fuel combustion remains unsolved. Although this research on full-size LRDs does not require the manufacture of a new material part, it is a complex and costly process similar to fire tests of the engine. Therefore, it is expedient and less expensive to conduct a study of the effect of polymer additives to kerosene on the completeness of fuel combustion on a low-thrust nuclear power plant using a displacement fuel supply system.

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USING THE VITE TOOL FOR FAST AND PRODUCTIVE DEVELOPMENT OF WEB APPLICATIONS BASED ON THE REACT LIBRARY

In today's world of rapidly developing information technology, web applications occupy a central place as a key tool for development and interaction in the digital environment. Their development is essential for providing access to information, facilitating effective communication, and creating opportunities for development in various spheres of life. With the spread of libraries and frameworks such as React,

developers have access to powerful tools to create high-quality and functional web applications. However, the speed of development and efficient use of resources remain a challenge for many developers.

A special feature of the React library is the application creation from components that represent user interface elements with their own logic and design, with the possibility of their reuse. This approach allows the developer to focus more on the design of the web application. The existing "create-react-app" tool, which uses the Webpack bundler, automates and simplifies the process of creating and configuring a React project, but it turns out that it can be less flexible in solving complex scaling problems, in particular those related to route management, server-side rendering, using third-party libraries with npm, and more [1]. In these cases, the web application slows down and becomes inefficient, and therefore, using full-fledged React-powered frameworks or customizing your own build and bundling process may be more appropriate.

When applying of full-fledged frameworks creates certain limitations, it is recommended to use a module bundler, such as Vite or Parcel, to deploy a personalized customization in React. Vite is currently gaining popularity due to its very fast build speed, support for Hot Module Replacement (HMR), SSR (Server-Side Rendering), and extensible plugin architecture that allows developers to extend and modify functionality [2]. The high speed of project build is ensured by compiling and maintaining the necessary dependencies through the **esbuild** tool. Unlike the alternative tool Webpack, which loads all the code when the server starts, Vite loads only the code needed for the selected page or component [3]. Vite uses on-demand compilation, compiling the code of each individual file only when it is needed. This saves reloading time and development speed, and therefore Vite has advantages over traditional make tools [4].

Vite offers an instant start of development thanks to its architecture that allows you to use ES Modules and HTTP/2 for fast code loading. Vite also offers a simple and straightforward configuration method that allows developers to customize quickly their project to meet their needs. Its extensive plugin compatibility makes it easy to integrate with various tools and technologies.

By creating a new React project using Vite, developers benefit from the speed and productivity of web application development. Vite can be useful not only for creating new projects, but also for improving the speed and performance of old ones.

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ADVANCES IN EFFECTIVE TENSION CONTROL AND OPTIMIZATION TECHNIQUES IN FILAMENT WINDING OF POLYMER COMPOSITE MATERIALS

Effective tension control in the process of filament winding of axisymmetric products made of polymer composite materials plays a key role in ensuring not only the quality but also the strength and stability properties of the final product. This process poses a complex engineering challenge, as it requires precise control of fiber tension during winding, taking into account various factors such as material type, winding speed, product geometry, and more.

An overview of existing methods for controlling fiber tension encompasses a wide range of approaches, from traditional mechanical systems with manual control to modern automated systems that utilize advanced technologies such as computer vision systems, tension sensors, and artificial intelligence algorithms for automatic regulation [1, p. 535].

The application of modern control technologies and algorithms opens up new possibilities for optimizing the filament winding process. For example, [2, p. 119] the use of machine learning systems allows for the adaptation of control parameters in real-time, considering the variable production conditions and properties of the materials used.

Optimization of fiber tension control methods involves searching for the most effective and accurate solutions that will ensure optimal preservation of fiber structural characteristics and minimize potential defects in the final product [3, p. 596].

The most popular real-life examples of equipment for automating fiber tension control include integrated control systems from leading equipment manufacturers in the production of composite materials, such as "Siemens," "ABB," "KUKA," and others, which utilize cutting-edge technologies to ensure the highest quality and productivity of the winding process [4, p. 102].

In conclusion, the research has demonstrated significant potential for improving filament winding processes of polymer composite materials through the utilization of advanced control and optimization technologies. Moving forward, emphasis should be placed on the development of innovative materials and their interaction with winding processes to achieve further progress. These avenues of development have the potential to pave the way for the creation of new high-performance products for various industries.

The prospects for continued exploration of advanced control technologies, such as artificial intelligence and machine learning, hold promise for further enhancing filament winding processes. Additionally, innovations in materials science and engineering will play a crucial role in driving future advancements. Together, these developments are poised to revolutionize the production of polymer composite materials, offering new possibilities for high-performance products across various industries.

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EFFECTIVE DEPENDENCY MANAGEMENT IN SCALABLE PROGRAMMING PROJECTS

In the dynamic landscape of software development, managing dependencies is a critical aspect, particularly as the projects scale in complexity and size. This necessitates the effective strategies to understand, control, and optimize the inter-dependencies between various components. By examining industry best practices, established principles, and practical tools, we aim to provide insights into fostering a robust and scalable codebase.

As programming projects grow, the structure of dependencies between various components becomes increasingly challenging to visualize and comprehend. New modules, libraries, and external dependencies can create the intricate networks of interactions, not only complicating the understanding of the current project state but also hindering changes or additions of new functionalities [1].

The use of different versions of libraries within a project can lead to unpredictable version conflicts. For example, if Module A uses version 1.0 of Library X, and Module B uses version 2.0, compatibility issues may arise, impacting the correctness of project building, deployment, and even functionality.

With the expansion of project scope and the addition of new components, maintaining a dependency structure that facilitates effective project scalability becomes challenging. The absence of clear rules and standards may render the project difficult to maintain, impeding the process of making changes [3].

The possible solutions to the above-mentioned problems might be as follows: a) use of dependency management systems, b) automated dependency analysis, c) standardization and documentation, d) application of design patterns and architectural solutions.

a) *Use of dependency management systems:*

dependency management tools such as Maven, Gradle, or npm provide mechanisms for automating dependency management. They automate the processes of downloading, installing, and updating libraries, ensuring uniformity in versions and preventing conflicts [1].

b) *Automated dependency analysis:*

utilizing tools for dependency analysis, such as Dependency Structure Matrix (DSM) or visualization tools, allows developers to better understand the relationships between project components. This enhances the perception of the project structure and facilitates decision-making regarding modifications [1].

c) *Standardization and documentation:*

implementing strict coding and dependency documentation standards helps to establish a unified approach within the development team. Documenting dependencies in clear and understandable formats makes the project more accessible to the new team members and streamlines the maintenance process [2].

d) *Application of design patterns and architectural solutions:*

utilizing design patterns, such as Dependency Injection, contributes to creating the loosely coupled components, making the project more flexible and ensuring an easiness of making changes. Applying the architectural principles like SOLID also aids in dependency management and facilitates an easiness of maintenance [4].

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OPTIMIZATION OF EXPONENTIAL FUNCTION COMPUTATION IN JAVA USING LINEAR INTERPOLATION METHOD

Exponential functions used by standard mathematical libraries have high precision but concurrently demonstrate considerable computational overhead. To optimize performance across various scenarios, such as neural network implementations

or time series forecasting, leveraging exponential function approximations can be warranted, thus mitigating computational burdens.

For instance, to address a specific task of decomposing spectra into individual bands [1], a mathematical model for approximating the experimental spectrum into its constituent components was utilized and implemented as a Java application. However, the execution time of one computation was approximately 0.067 milliseconds, while the overall program execution time amounted to 275.4 seconds, which did not meet the requirements. Upon analyzing the application, it was found that the primary cause of slowdown was the utilization of the standard `java.Math.exp()` function, which is implemented as a native method and consequently invoked via the Java Native Interface (JNI). The process of invoking a native method involves suspending the execution thread of the Java Virtual Machine (JVM), transferring control to the native code of the operating system, and returning control to the suspended thread, which is quite time- and resource-intensive.

Therefore, as an alternative, the possibility of creating a custom `exp()` function utilizing linear interpolation was considered. To achieve this, it was necessary to take into account the representation of floating-point numbers. They are represented by the formula [2]:

$$k = (-1)^s \times (1 + f) \times 2^{x-x_0} \quad (1)$$

where, s – a binary variable that determines the sign of the number and can take on the values 0 or 1 (sign), f – a mantissa (fraction) – a binary fraction in the range $[0,1)$, and x – the exponent shifted by a constant x_0 . In the JVM, according to the IEEE-754 standard, floating-point numbers are defined with a 52-bit mantissa and an 11-bit exponent with bias $x_0=1023$, occupying 8 bytes (Fig. 1). The components of this representation can be manipulated by accessing memory bits as a pair of 4-byte *integers*. Any integer written to the x component (via the higher-order 4 bytes) will be exponentiated when the bytes are read back in floating-point format. This is a key concept for fast exponentiation.

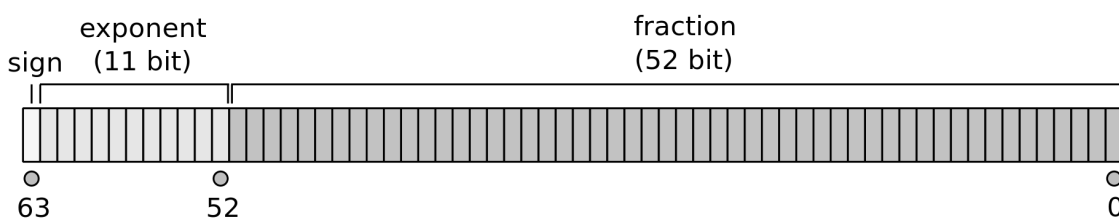


Figure 1. Bit representation of double-precision numbers according to the IEEE-754 standard

Since the component x resides in the 4 most significant bits of the number, the integer k to be exponentiated must be left-shifted by 20 bits after the addition of the x_0 offset. Thus, $i = 2^{20}(k+1023)$ calculates 2^k for integer k . For non-integer arguments, the fractional part of k will transition to the higher-order bits of the mantissa f , according to the IEEE-754 specification, representing linear interpolation between adjacent integer exponents. Therefore, this method effectively exponentiates real numbers by searching in a table of 2^{11} values and performing linear interpolation between them.

To compute e^y , one needs to divide i by $\ln(2)$. The complete transformation of y , required for rapid approximation in IEEE-754 format, is defined by the expression:

$$i = ay + b \quad (2)$$

where, $a = 2^{20}/\ln(2)$, $b = 1023 \cdot 2^{20}$. In the Java environment, expression (2) will take the following form:

```
public static double exp(double val) {
    final long tmp = (long) (1512775 * val + 1072693248);
    return Double.longBitsToDouble(tmp << 32);
}
```

The *long* data type is used to avoid overflow. Furthermore, by performing a bitwise shift by 32, the approximated value of the function e^y is returned.

A comparative performance analysis of the standard and custom functions for $e^{(yi)}$, $i=10^8$ is provided in Table 1.

Table 1. Comparison of functions

Function	Calculation time, ms	Maximum deviation	Minimal deviation
java.Math.exp	9244	0%	0%
Approximated exp	1864	3.02%	0.07%

The conducted study demonstrated that the application of linear interpolation for functions of the form e^y increases speed and provides a significant improvement in work efficiency by reducing the computation time of the exponential function compared to the standard **java.Math** library by approximately 5 times. The developed Java method has a small deviation (approximately 3%) from the exact values of the exponential function, which does not significantly affect the overall quality of the final result.

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MODERN METHODS OF ADDITIVE MANUFACTURING OF THREE-DIMENSIONAL OBJECTS BASED ON FUGO TYPE PRINTER

Modern methods of additive manufacturing of three-dimensional objects (for example, stereolithography, 3D printing, etc.) allow the production of high-quality products with high precision, but such methods have significant limitations and drawbacks.

At the moment, there is a need for a system and method to ensure 3D printing with improved part quality and increased printing speed. A team of developers from the USA has patented [1] the Fugo 3D printer based on a centrifuge, which can significantly accelerate the printing of complex parts, their quality, and application conditions. Production based on a centrifuge does not require the influence of gravity, which is an invaluable breakthrough and a bright ray of light for the future of humanity, as it will allow printing any complex parts and tools in space, which until now has not been possible for liquid polymer printing technologies. In addition to eliminating the drawbacks of existing 3D printers and approaches to manufacturing super complex objects, this enables people to simplify printing from metal and other super hard materials greatly. Like other printing systems, this printer requires high-quality and fast software to convert user models into printer instructions. Developing such software for an innovative cylindrical printer is an extremely important task as it directly affects the quality and speed of printing models, which is necessary for many users and entire enterprises.

The basis for future research is the transformation of data about a 3D model into a sequential set of layers for printing on a cylindrical printer, which is interpreted as a set of instructions for the Fugo type printer that are executed using internal

software that controls the main components of the printer. It should be mentioned that this work does not relate to the embedded software of the Fugo printer, which controls microcontrollers and other components. The work involves research aimed at transforming data understandable to the end-user into data understandable to the Fugo type printer.

To determine the format of layer data for the Fugo printer, it is necessary to consider the operation scheme of its main components.

The components of the system that provides additive manufacturing of objects based on a centrifuge are:

- the rotating drum containing a photopolymer material that solidifies when exposed to a light source;
- a photopolymer material is evenly distributed over the product during the movement of the rotating drum;
- the light source module consisting of a set of vertically arranged lasers capable of curing the photopolymer material;
- the set of platform drive elements connected to numerous perforated platforms to control their position inside the rotating drum during operation;
- the photopolymer material delivery system for adding a controlled amount of photopolymer material to the rotating drum.

A more detailed description of the operation of the Fugo type printer is planned to be provided in future publications.

Thus, one of the main tasks of this work is to transform data about 3D models into such a layer format, commonly referred to as "slicing." The only difference in this setting is the need to apply cylindrical slicing instead of planar slicing, as is customary in more well-known liquid photopolymer printing technologies (DLP, LCD, etc.).

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USE OF CRITICAL THINKING TECHNOLOGIES IN TEACHING MATHEMATICAL DISCIPLINES

In today's world, where technology is changing rapidly and competence in technical sciences is essential for a successful career, it is important for students not only to acquire specific knowledge but also to develop analytical and critical thinking. The use of critical thinking technologies in teaching mathematical disciplines is becoming a necessity for the formation of professionals capable of independent analysis, solving complex problems and innovative thinking.

Critical thinking is the ability to think, analyse and understand information, compare facts, make independent judgements and make decisions based on good judgement. A teacher who tries to work creatively, understands the problems of his or her students, should be able to orientate them to critical reflection on any task, their role in solving it and their own competence [6].

The idea of developing critical thinking originated in the United States, in the work of the famous American psychologist of the twentieth century, J. Dewey. Dewey was a significant figure in the philosophy of pragmatism and the founder of functional psychology, a proponent of educational progressivism. He is credited with the statement that the fundamental purpose of modern education is not just to provide information, but to develop a critical way of thinking. Education is oriented towards the future, which cannot be predetermined, and therefore, the priority is to develop the type of thinking that allows for an adequate assessment of new circumstances and the formation of strategies to overcome problems that may arise [5, p. 4].

The founder of the Institute for Critical Thinking, Matthew Lipman, defined critical thinking as skilled, responsible thinking that makes good judgements because it is based on criteria, corrects itself and takes into account context [4, p.4].

In Ukraine, interest in the development of critical thinking as an educational innovation emerged at the end of the twentieth century. Thus, a number of Ukrainian scholars pay considerable attention to the study of critical thinking: I. Bondarchuk, T. Voropai, O. Pometun, S. Terno, O. Tyaglo, L. Terletska and others. The idea

of developing critical thinking is quite new for Ukrainian didactics and teaching methods [3, p. 3].

Today, it is clear that critical thinking does not mean negative judgements or criticism, but rather a reasonable consideration of a variety of approaches to make informed judgements and decisions. Therefore, according to the famous American psychologist D. Halpern, future-oriented education should ensure that students develop two main groups of skills: the ability to quickly navigate the growing flow of information and find the right information, and the ability to comprehend and apply the information acquired [4, p.4].

In this regard, the task of education is not only to give the student a certain set of knowledge, but also to teach the student to learn, to activate mental activity, to use intuitive, associative and logical thinking to find new atypical ways of solving practical problems, i.e. to teach to work, to teach to coexist, to teach to live.

When studying any phenomenon, the student must learn to break it down into simple elements and build logical sequences. This will allow you to create algorithms, which means correct programmes describing a certain process, break down the whole into small parts, describe each element and, once assembled, get the whole again. The ability to think logically is especially important here. Intuition, life experience, and logic allow you to rationally combine blocks of programmes.

An essential skill for students is the ability to distinguish between cause and effect. As Aristotle said: «In order to study, one must organise». We can consider any phenomenon in terms of cause-and-effect relationships, using the mathematical apparatus correctly, and describe it in blocks, having previously set a logical sequence of events and processes [2, p. 14].

For example, when analysing a chain of textual tasks in mathematics. Solving textual problems in mathematics is the most important means of developing students' basic cognitive activities and stimulating their creativity. By solving such tasks, students learn to analyse a life situation, reason, find a solution strategy, and critically evaluate the result.

For more than a hundred years, scientists have been studying the process of human problem solving. The well-known psychologist S. L. Rubinstein characterised problem solving as a process of reformulation, in which the conditions and requirements of the problem are continuously analysed through a synthetic act of correlation [1, p. 48]. When solving textual tasks, students have serious difficulties

in isolating the quantities related to each other by any dependencies, giving a mathematical interpretation of the verbal description of this dependency, or even finding it in the text of the task. To solve this problem, critical thinking techniques can help, as they focus on problem formulation and search for a solution and are carried out in three stages: challenge, comprehension and reflection.

The impact of critical thinking in mathematics cannot be overstated. This key skill helps students to delve deeper into mathematical concepts, to look at them from different perspectives and understand their true meaning, to learn not only how to solve specific problems, but also why these methods work and when they should be used. They learn to evaluate different approaches and choose the most effective one. Critical thinking helps to analyse mathematical statements, check their logical consistency and look for possible errors or flaws, and as a result, build more reasonable solutions and conclusions. Students learn to ask questions and check evidence to make sure a statement is correct or to identify its weaknesses.

So, critical thinking plays a key role in the study of mathematical disciplines, promoting a deep understanding of the material and developing analytical skills that are essential for success in the world of modern technology and scientific research.

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LAYERED DIELECTRIC STRUCTURE FOR MICROWAVE WIRELESS POWER TRANSMISSION SYSTEMS

Wireless power transmission (WPT) is a rapidly developing science and technology area in which intensive research is being carried out now. Various WPT technologies are being developed, WPT system projects of numerous classes and functionalities are being implemented, new areas of their application are being discussed, and numerous theoretical and experimental studies are being carried out. The references devoted to the WPT research indicate their increasing influence on the development of global energy processes. Nevertheless, despite significant advances in this area, many problems are still in the early stages of research [1, p. 1]. Currently, several methods of WPT can be distinguished: inductive, microwave, laser, and energy harvested from the surrounding electromagnetic field. The concept of wireless energy transmission via microwaves was practically implemented in the 1960s due to the radar technology development, the exploration of the microwave frequency range, and the invention of rectennas by W. Brown. His work resulted in the creation of a new class of energy systems – microwave WPT systems. Such systems consist of a transmitting subsystem, whose task is to convert the energy from the primary source into focused EM waves, and a receiving subsystem in the form of rectennas. The purpose of rectennas is to receive and convert the focused EM waves into direct current, which is supplied to the energy consumer then [2, p. 116].

Higher harmonics are emitted due to the presence of nonlinear elements in the receiving subsystem of microwave WPT. From a practical point of view, it is important to reflect the radiation at the second harmonic of energy basic transmission frequency (EBTF) backward into the device for converting an electromagnetic wave into direct current. For this purpose, a layered dielectric structure was considered in a rectangular waveguide, which was supposed to reflect radiation at the frequency of the second harmonic of EBTF and to match in a wide frequency pass band around the EBTF. The layered dielectric structure consisted of three parts: matching, Bragg, and reverse-matching ones. The first and third parts of the layered dielectric structure were comprised of matching dielectric layers at the EBTF. This structure was placed in a rectangular waveguide with a cross-section of 23mm×10mm and

filled with air. It was taken into account that the angle of the electromagnetic wave incidence on the layered structure in the waveguide depends on the wavelength and is determined by the Brillouin concept for the fundamental wave H_{10} according to the following formula:

$$\theta_i = \text{asin} \left(\frac{\lambda}{2a} \right) \quad (1)$$

The reflectance of the structure was found using the known expression:

$$R(f) = \frac{R_{01} + R_{12} \exp(-i \cdot 2\varphi)}{1 + R_{01} R_{12} \exp(-i \cdot 2\varphi)}, \quad (2)$$

where R_{01} and R_{12} are Fresnel reflectance complex coefficients.

Thus, the dependence of the reflectance versus frequency was constructed for the given structure. This layered dielectric structure allows achieving the width of the pass band of 2.2 GHz at EBTF and the width of the block band approximately 2 GHz at a frequency of the second harmonic. The highest value of the reflectance was obtained at the second harmonic frequency, which was equal to 0.98.

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MAJOR GLOBAL SATELLITE NAVIGATION SYSTEMS, ROLE AND CHALLENGES

Satellite navigation systems are complex electronic and technical systems consisting of a set of ground and space equipment and designed for positioning in space and time, as well as determining of movement parameters for land, water and air objects [3, p 125].

The role of positioning systems in the modern world is difficult to overestimate. A failure or absence of a navigation signal from the usual GPS can lead to chaos in the operation of air and sea transportation, consumer goods delivery services, and

affect the functions of smartphones. Today, it is difficult to imagine the effective use of troops without the data from navigation satellite systems.

Common elements of satellite navigation systems are:

1. An orbital group consisting of approximately 30 artificial Earth satellites that emit special radio signals;
2. Ground-based command and control system, which contains units for measuring the current position of satellites and transmitting the received data to them for correcting information about their orbits;
3. Receiving client equipment used to determine coordinates;
4. Optional: a ground-based beacon system and an informational radio system for transmitting corrections to users [2].

The principle of operation of satellite navigation systems is based on measuring the distance from the antenna on the object, the geographical coordinates of which must be obtained, to the satellites, the location of which is known with high accuracy at any given time. The table of positions of all satellites –an almanac – must be available in each satellite receiver before measurements are started. As a rule, the receiver stores the almanac in memory since the last time it was turned off. Each satellite transmits the entire almanac in its signal. Thus, knowing the distances to several satellites of the system, it is possible to calculate the position of the object in space.

The method of measuring the distance from the satellite to the receiver antenna is based on the certainty of the propagation speed of radio waves. To realize the ability to measure the time of the radio signal being propagated, each satellite of the navigation system emits accurate time signals using system synchronization. During the operation of the satellite receiver, its clock is synchronized with the system time, and during subsequent reception of signals, the delay between the time of radiation contained in the signal itself and the time of reception of the signal is calculated. With this information, the navigation receiver calculates the coordinates of the antenna. All other movement parameters are calculated based on measuring the time the object spent moving between two or more points with coordinates determined by previous calculations [3, p 126].

As of 2023, there are four global systems in operation: the American Global Positioning System (GPS), the Russian Global Navigation Satellite System (GLONASS), the Chinese BeiDou Navigation Satellite System, and the European Galileo.

The American «Navigation Satellite Timing And Ranging Global Positioning System» (NAVSTAR-GPS) is the system we use most often. It includes 32 spacecraft rotating in circular orbits in 6 orbital planes at an altitude of 20,183 km. Typical GPS accuracy is about 6-8 meters. On the territory of the USA, Canada, Japan, China, the European Union and India there are WAAS, EGNOS, MSAS stations that transmit corrections for the differential mode. This allows to reduce the error to 1-2 meters in the territory of these countries. GPS is in the hands of the US Space Force [2; 3, p.124-128].

The Russian «Global Navigation Satellite System» – GLONASS operates similarly to the American GPS, and consists of 24 active satellites located approximately 19,100 kilometres above the earth, and the satellite's orbit around the Earth takes 11 hours and 15 minutes. Errors of GLONASS navigation indicators are 3-6 m when using an average of 7-8 satellites. An important feature of GLONASS is the possibility of using the navigation system at high latitudes in the northern and southern polar regions, where the GPS signal is poorly received.

The Chinese «BeiDou» currently has 35 satellites in orbit, while, according to official data, the accuracy of determining the coordinates of the object for the military sphere by the BeiDou system is up to 2 m, for the civilian one – up to 10 m [2; 3, p.128-129].

The European «Galileo» was built only with the civilian market in mind, however, since 2008 it has been allowed to be used for military operations to ensure European security. So far, the Galileo program has placed 30 satellites in orbit at an altitude of 23,222 kilometres. Currently, the system uses a full constellation of satellites. For most places on earth, 6 to 8 Galileo satellites are available at all times, which means a very high accuracy, which in most situations is measured in centimeters rather than meters. Galileo is compatible with the GPS system, which further improves the accuracy of measurements, and its operation is also supported by the EGNOS system (Geostationary Navigation Overlay Service), consisting of ground components and satellites responsible for improving the operation and accuracy of satellite navigation systems [3, p 129; 4].

Is it easy to block GPS? Disrupting enemy navigation tools is effectively used to combat cruise missile guidance. Satellite signal jamming and blocking is becoming increasingly common, and as a result, weapons based on satellite data alone are no longer as effective as they once were. Interfering with a GPS signal is not

particularly difficult. A radio transmitter of the appropriate power and frequency placed near a protected target prevents GPS receivers from receiving the correct data. Satellite manufacturers are trying to combat this by developing increasingly jamming-resistant signals. However, in principle, the advantage is always on the side of those who attack. They can respond to changes faster thanks to less expenditure of time and resources, because satellites cannot be modernized cheaply and quickly. However, we should not expect the military to abandon the GPS system. On the contrary, the fight against jamming systems will increase, and additional components will be added to the equipment and weapons that will prevent GPS signal jamming. Engineers are also looking for fundamentally new technical solutions. For example, after a series of hacks and failures in the GPS system, the US military and several American laboratories announced that they were working on a new quantum navigator that could completely change global search systems, eliminating the need for satellites [1].

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DOCKER AS A MEANS OF LOAD BALANCING

A container is an instance of a Docker image and serves to run applications, processes, or services. It is formed from the content of the Docker image, an execution environment, and a standard set of instructions. If necessary, many instances of containers can be created from the same image to expand the application. The container includes the operating system, user files and metadata. A Docker image contains information on how to initiate a container, including which process to start at its launch, among other settings [3].

A Docker image is read-only; when a container is initiated, a writable layer is added on top of the image using a union file system, allowing the application to be launched.

Docker Swarm is a tool for organizing a cluster in Docker, transforming a group of Docker hosts into a single cohesive cluster. Each host in this cluster functions as either a manager or a worker node, with the mandatory condition of having at least one manager node. The physical placement of servers is not critical, but it is preferable for all Docker nodes to be located in the same local network to simplify management and problem-solving [1].

Docker Swarm provides several important functions for efficient container management within the cluster, including:

1. Cluster automation: easy integration of multiple Docker hosts into a single cluster.
2. Node management: supports managing and worker nodes for task distribution.
3. Scalability: simple scaling of services according to needs.
4. Load balancing: distributes traffic among containers to optimize resources.
5. Port opening and routing: automatically routes external requests to the appropriate containers.
6. Declarative service description: uses configuration files to define services.
7. Self-recovery: automatically recreates containers upon their failure.
8. Security: secures communication between nodes using TLS.
9. Container orchestration: smartly distributes containers across nodes according to resources and settings [2].

Fig. 1 illustrates the architecture of Docker Swarm.

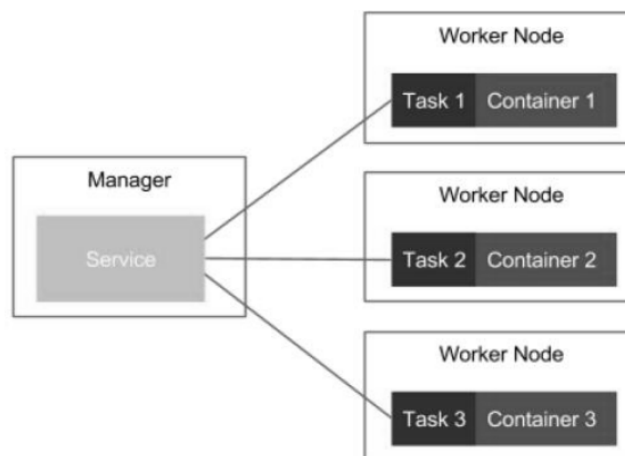


Fig. 1. Docker Swarm Architecture

In summary, Docker facilitates the easy deployment of applications into containers, ensuring their isolation and portability. Docker Swarm extends these capabilities by enabling the management of container clusters.

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ARTIFICIAL INTELLIGENCE (AI) IN CYBERSECURITY: KEY ASPECTS AND CHALLENGES

Artificial intelligence (AI) has revolutionized the cybersecurity industry by providing advanced threat detection and prevention. This technology can help security teams counter threats more effectively by providing real-time analysis of potential threats and vulnerabilities. By detecting and eliminating security threats before they can cause damage, AI can significantly improve the overall security of an organization.

Artificial intelligence is becoming an essential tool in the fight against cyber threats, including phishing, fraud, and data theft [3]. The potential for severe losses from cybercrime has led to an increasing focus on the use of AI to protect corporate networks and data [1]. By analyzing large amounts of data, AI can detect even the slightest signs of a cyber threat and take preventive measures [3].

However, as the role of AI in cybersecurity grows, new problems arise. For example, many AI systems operate as black boxes, making the decision-making process opaque. This makes it difficult to understand what decisions are being made and why. There is also a risk of malicious attacks when attackers exploit vulnerabilities in the systems [2]. To overcome these problems, it is necessary to develop and improve the use of AI in cybersecurity actively: it is important to ensure accountability of decisions and data confidentiality in artificial intelligence systems.

In addition, the development of joint AI systems and the intersection of AI and quantum computing may be a promising area for further development of cybersecurity [2].

As cybersecurity threats are constantly growing, information protection requires not only a reactive, but also a proactive approach. Modern technologies are able to detect and prevent cyber threats at an early stage and ensure reliable protection of networks and data.

The next step in the development of cybersecurity might be to increase interaction between industry, academia, and government to develop and implement new technologies and defense strategies jointly. Cooperation in this area can provide a more effective response to threats and increase resilience to cyber attacks.

Another important aspect is to train users and raise their awareness of cybersecurity. The responsibility for network and data security lies not only with information security professionals, but also with all users. Awareness and understanding of risks can significantly reduce cybersecurity threats.

Therefore, the development and use of AI in cybersecurity requires continuous improvement of technologies and methods, as well as cooperation between organizations and institutions in various industries. Continued research and innovation in this area are important to improve the effectiveness of protection against cyber threats and ensure the security of the digital space.

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USE OF BLOCKCHAIN TECHNOLOGIES IN MODERN ENGINEERING PROJECTS

In today's world, engineering is constantly being influenced by technological innovations that help to improve the efficiency, reliability and safety of engineering projects. One of these innovative technologies that has recently gained significant importance is blockchain. Blockchain, originally known as the technology behind cryptocurrencies, is now widely used in a variety of fields, including engineering. This innovation plays a critical role in ensuring the security and reliability of data in engineering projects. Due to its characteristic as a distributed system, where each block of data contains the previous hash code, blockchain becomes almost impossible to modify without changing all subsequent blocks, making it an ideal tool for storing important engineering data such as plans, specifications and test results. Improving project management efficiency is another key benefit of using blockchain in engineering projects. In addition, blockchain can reduce the cost of intermediaries and optimize production processes. This technology can reduce the number of intermediaries required in the supply chain and optimize inventory monitoring and management processes. This leads to lower operating costs and increased overall efficiency of production processes [1].

Supply chain management of materials and equipment becomes much more efficient with blockchain. Thanks to blockchain technology, all stages of the supply chain can be tracked, including production, transportation, and delivery. This reduces the time and resources typically spent on supply chain management and increases trust between supply chain participants. Maintaining logs and logistics data during construction is another area where blockchain can help optimize processes. Records of construction materials, labour, and other resources can be stored in a secure and unalterable source, ensuring that the data is reliable and accurate. It allows businesses to avoid conflicts and misunderstandings during the construction process [2].

However, implementing blockchain in engineering projects also brings its own challenges and limitations. Resilience to changes in the regulatory environment is one of the main challenges in implementing blockchain in engineering projects.

On top of that, technological innovations are evolving rapidly, and legal frameworks may not always be able to keep pace with these changes. Therefore, companies seeking to implement blockchain in their engineering projects should be prepared to adapt to changes in the regulatory environment.

The high cost of implementing and integrating the technology is another important aspect that can delay the adoption of blockchain in engineering projects. From initiation to maintenance and upgrades, blockchain systems involve high financial costs for software development, staff training, and security, which can make implementation difficult for many companies.

Data privacy and legal compliance issues can also make it difficult to implement blockchain in engineering projects. As data on the blockchain is publicly available and cannot be deleted or altered, there is a risk of data privacy and confidentiality being compromised [3].

Therefore, even with the challenges that accompany the introduction of blockchain in engineering projects, its potential to improve data management and security makes it a key tool for the future development of the engineering industry.

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CRITERIA FOR SELECTING POLYMERIC MATERIALS

Polymeric materials constitute an integral part of contemporary transportation manufacturing, providing not only convenience and aesthetic appeal but also functionality to the interior coatings of moving vehicles. When selecting materials for interior treatment, transportation manufacturers must consider various criteria, including mechanical, chemical, thermal, aesthetic, ecological, and economic aspects. Let's examine each of them.

Mechanical properties: Materials should be sufficiently robust to withstand mechanical loads arising during the vehicle's movement and resistant to wear, ensuring prolonged service life without compromising quality.

Chemical resistance: Given the diverse operating conditions of moving vehicles, it's crucial for polymeric materials to withstand chemical and climatic influences such as moisture, salts, oils, and solvents. This ensures long-term operation of interior coatings without damage or deformation, as well as prevents the formation of hazardous substances.

Thermal stability: Moving vehicles may be subjected to various temperature fluctuations, highlighting the importance of selecting materials with high thermal stability. This guarantees that coatings maintain their structure and properties even under extreme temperatures.

Aesthetic characteristics: In addition to functionality, the aesthetic appearance of interior coatings is significant for consumers. It is essential to ensure an attractive appearance and the ability to choose colors and textures.

Ecological aspects: Increasing attention to environmental issues emphasizes the importance of selecting eco-friendly materials. When choosing materials for interior coatings, manufacturers must consider their renewability, recyclability, and environmental impact during production and use.

Economic aspects: Economic factors are crucial in the automotive industry. Interior coatings should not be excessively costly, as their utility may not justify high expenses.

Manufacturing methods: Polymer coating manufacturing methods can be classified based on application techniques, which also depend on the type of material and application characteristics. Major methods include physical application (spraying, rolling, or brushing), chemical application, thermal application, and electrostatic application. It's worth noting that classifying polymer coating application methods helps choose the most efficient method for specific applications, considering requirements for quality, speed, and process efficiency.

Furthermore, interior coatings of moving vehicles are subject to various requirements that may vary depending on factors such as the type of carriage, its purpose (passenger or freight), regional standards, and passengers safety and comfort requirements. Key requirements include fire safety, hygiene and ease of cleaning, acoustic and thermal insulation. It is worth noting that every material used

in passenger carriages, especially in the interior, must be certified, and its characteristics should not exceed the established standards.

Analysis of the properties of materials and the criteria applied to them enables the formulation of requirements for polymeric materials for interior coatings and their reasoned selection.

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THE UNCANNY VALLEY EFFECT OR HOW OUR BRAIN PERCEIVES ROBOTS

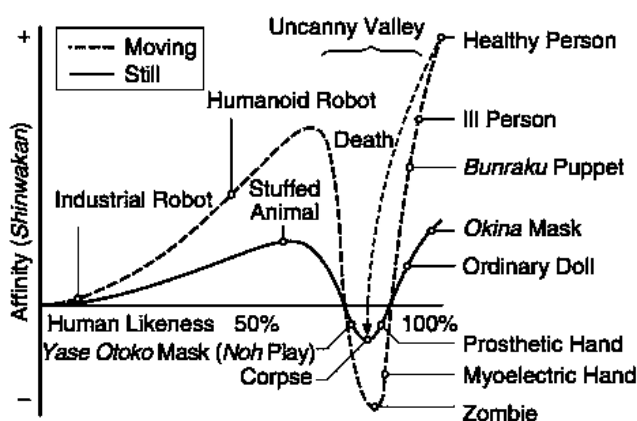


Fig. 1. Masahiro Mori, «The Uncanny Valley», IEEE Robotics & Automation Magazine, 19(2):98-100 (June 6, 2012)

Until now, the phenomenon of the «uncanny valley» has only a practical evidence base rather than a scientific one. The word «valley» here means «cavity, recess, critical point». If this «deepening» is transferred to the graph, it will display the degree of horror that a person experiences when observing anthropomorphic subjects and objects (dolls, masks, robots).

This phenomenon was first noticed and described by a psychiatrist of German origin, Ernst Jentsch. Back at the beginning of the 20th century, he came to the conclusion that the feeling of creepiness and horror is a mental phenomenon that arises when observing something very familiar from an unusual, non-standard perspective, an object that is very

reminiscent of something. Jentsch associated these anxious experiences with uncertainty and misunderstanding whether a lifeless subject or object is animate [2].

Androids, controllable dolls, or photorealistic characters themselves are not always scary. In a static position, they are more likely to cause fear in those who already have corresponding phobias. For most people to experience anxiety, something more serious is needed—behavior or signs that are unusual for a person:

- Facial expressions. Both too active, such as unreasonably bulging eyes or a wide open mouth, and meager or inhibited. In 2014, British scientists used an experiment to test how this works. Children aged 9 to 11 were alternately shown videos of real people and computer-generated faces. Among the latter there were both fully animated ones and those whose eyebrows, foreheads and eyes remained motionless. Children considered characters with partial facial expressions to be especially strange and unfriendly [1]. A completely motionless face can also be read by the brain as an alarm signal if a humanoid creature moves or talks.

- Mechanical speech. Interference, synthetic sound, or echo, as if sounds are coming from a pipe. By the way, the opposite situation may also be true: an insufficiently believable robot with a human voice can also frighten.

- Unnatural movements of the limbs. A sharp rise of the arm, knees that do not bend when walking, a head turning 180 degrees.

- Strange combinations of features. The appearance in behavior or appearance of something characteristic not of a person, but of other creatures.

Some researchers have also suggested that the effect should be called «a cliff» or «wall» rather than «a valley», because the rejection of a humanoid entity occurs abruptly, rather than gradually. Any minor change can make such a character disgusting, after which sympathy for him will fall down as if from a steep cliff.

In the modern world, the concept of the «uncanny valley» relates more to the field of robotics and artificial intelligence. The relationship between man and machine has been developing for decades. Robots have made our lives easier and simpler, saving us from hard and everyday work. In the middle of the 20th century, when the interaction between machines and humans began to manifest itself more and more, scientists considered that it would be more logical to bring the external data of robots closer to human ones.

This is how the first androids turned out. It was assumed that over time it would be almost impossible to distinguish a robot from a living creature, thereby a person would begin to feel sympathy for his own kind.

Thus, the Japanese scientist Masahiro Mori came to the conclusion that in most cases, a robotic machine is perceived by the human user in a very contradictory and wary manner. But in order to reduce this hostility, it is enough to make the external resemblance of robots to humans as close as possible. As it turned out later, the excessive «animation» of androids and extremely realistic appearance also give the effect of rejection.

Mori later noted that the «escalating creepiness» effect reaches its maximum point when the robotic object begins to move [3].

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ETHICS IN THE ERA OF ARTIFICIAL INTELLIGENCE

The modern world is changing rapidly. About 80 years ago people were just starting to create computers, and now development has gained such a pace that it is difficult for an ordinary user to keep up with all the innovations that we see around ourselves: from the approaching ban on internal combustion engines to AI, which can generate text for any query. The development of the latter is growing significantly with each day, and along with this is growing the question of the ethics of using this invention.

The issue of “machine morality” was first developed by science fiction writers. Isaac Asimov should be considered a popularizer in this field [1]. It was him who created the “Three Laws of Robotics” in the short story “Runaround”, which he supplemented with a zero rule in the story “Robots and Empire”. In general, they are based on the fact that AI should not harm humanity and a specific person, and it

must obey orders and protect its safety, only if it does not contradict the above. Later in 2007, the rules formulated by the writer were used in the development of the “Statute of Ethical Standards for Robots” in South Korea [2].

In the modern academic environment, artificial intelligence optimizes students’ time management and improves their learning experience [3]. It identifies shortcomings in student work and suggests specific steps for their correction. In addition, thanks to artificial intelligence, learning becomes more dynamic and fast, which leads to greater student interest. However, in this case, we have the following dilemma: if the work presented by the student is mostly created using AI, can it be considered original? It is important to note that in the context of education, the work presented by the student should reflect his own contribution, skills, and understanding. If artificial intelligence is used as a tool, but the main work, ideas, and execution all belong to the student, this can be considered an original work. However, if artificial intelligence generates a significant part of the work, this may cast doubt on its originality. With the development of artificial intelligence and the increase in data processing, including personal data, it is important to guarantee its confidentiality.

Modern development of artificial intelligence is impossible without informed consent of users. For example, OpenAI, when registering, informs that each chat with ChatGPT is used by the company to improve the model and service; that is, it is not completely confidential [4]. This aspect of working with AI should be limited in the future, as with its development it can lead to the loss of a significant amount of private information and the possibility of its seizure by third parties for profit, or to harm the owner of the information.

Therefore, in the modern world there is a rapid development of technologies, in particular artificial intelligence, which quickly transforms various spheres of life. It is important to understand and seek answers to ethical questions that arise along with this development. Special attention should be paid to the moral aspects of using AI, in particular in the context of responsible attitude to safety and privacy of data. It is also worth focusing on academic integrity and author’s contributions in works where it is especially important, in particular in educational activities. Thus, this work is designed to draw attention not only to the possibilities of AI, but also to a careful consideration of the ethical, social, and legal aspects of the development of artificial intelligence to ensure its positive impact on society.

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INFORMATION TECHNOLOGY FOR DECISION SUPPORT IN VIDEO SURVEILLANCE AND MONITORING TASKS

Information technologies and decision-making systems are becoming key elements in solving video surveillance and monitoring tasks in the modern world. Due to the constant development of technologies, new opportunities are emerging to optimize the processes of collecting and analyzing large amounts of video data, which provides unique opportunities for making informed and effective decisions in the field of security, transport control, territorial planning and many other areas.

Due to the growing volume of video data and the need for real-time decision-making, information technology plays a crucial role in the development of modern video surveillance and monitoring systems. The use of intelligent image processing, machine learning, and data analysis algorithms allows improving event detection, object identification, and decision automation systems. The relevance of this topic lies in the search for effective technological solutions that will ensure a high level of security and efficient resource management in the face of a growing amount of video data. Improvement of the accuracy and speed of video stream analysis is an important component for the successful implementation of video surveillance in modern society [1, p. 13].

Information technologies aimed at supporting decision-making are becoming an integral part of video surveillance and monitoring, given the current technological progress and large amounts of video data that require efficient analysis and processing.

The use of intelligent image processing and machine learning algorithms in video surveillance enables automation of the process of event detection and object

identification. Such technologies authorize systems to independently analyze a huge volume of video streams, recognize anomalies and respond in a timely manner to potential threats or malfunctions [2, p. 21].

The ability of information technology to process great number of video data in real time is extremely important. Collecting and analyzing large amounts of information requires high performance and speed, which is achieved with the help of specialized software solutions and equipment.

Information technology also plays a pivotal role in making decisions based on video data analysis. Automated systems not only provide operators with the necessary information and can also independently recommend intervention strategies based on previous experience and training.

The use of information technologies in video surveillance not only increases the efficiency of security and control systems, but also contributes to sustainable development by optimizing the use of resources and increasing the level of security in society. This integrated approach, combined with the constant development of technology, makes information technology an integral part of the successful implementation of video surveillance and monitoring in the modern world.

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PRODUCTION AND TECHNOLOGICAL PROCESSES IN MECHANICAL ENGINEERING

The production process is used to transform natural objects into a product useful to humans. The production process includes all the stages that natural objects go through on the way to transforming them into a finished product.

The production process carried out at a machine-building plant is part of the entire production process of transforming natural objects into a machine. Thus,

a production process in mechanical engineering is a set of all stages that semi-finished products go through on the way to transforming them into a finished machine.

A technological process is a sequential change in the shape, size, properties of a material or semi-finished product in order to obtain a part or product in accordance with the specified technical requirements. The technological process of machining parts is part of the overall production process of manufacturing the entire machine [1, p. 7].

Any technological process consists of the smallest technological processes or is part of a more a more complex one. For example, the technological process of assembling of an automobile engine, on the one hand, can be divided into smaller ones that differ from each other: technological processes of assembling a connecting rod and piston group, cylinder block or gearbox; on the other hand, the technological process of engine assembly process is part of the technological process of assembling a vehicle as a whole.

Manufacturing processes are the foundation of modern industrialization, driving the creation of a vast array of products that touch every aspect of our daily lives. As a vital subset of mechanical engineering, manufacturing processes encompass a diverse range of techniques and technologies that transform raw materials into finished products with precision, efficiency, and innovation [2, p. 1].

In mechanical engineering, the first step to creating a new product is to have a clear understanding of what the customer needs and what the product should do. Engineers need to be really knowledgeable because they use science and engineering ideas, like forces, how people hold and use things, what materials to use, and heat energy, to guess how well the product will work, how safe it is, and if it can be made easily.

After fine-tuning the initial design idea, it's vital to pick the right materials that will meet the product's needs and can be made effectively. Engineers look closely at each material's characteristics –like how strong, flexible, hard, rust-resistant, and heat-stable it is –to make sure it's a good fit for the job, the environment it will work in, and the budget. With new developments in materials science bringing out fresh options like advanced composites and alloys, staying informed is key.

The next step is the actual production of the product, using different tools and techniques. There are four basic production processes for producing desired shape

of a product. These are casting, machining, joining (welding, mechanical fasteners, epoxy, etc.), and deformation processes. Casting process takes advantage of the fluidity of a metal in liquid state as it takes shape and solidifies in a mold. Machining processes provide desired shape with good accuracy and precision, but tend to waste material in the generation of removed portions. Joining processes permit complex shapes to be constructed from simpler components and have a wide range of applications.

Deformation processes exploit a remarkable property of metals, which is their ability to flow plastically in the solid state without deterioration of their properties. With the application of suitable pressures, the material is moved to obtain the desired shape with almost no wastage. The required pressures are generally high and the tools and equipment needed are quite expensive. Large production quantities are often necessary to justify the process.

In making products, it's very important for mechanical engineers to check everything is made well, so it's safe and works like it should. They use a bunch of different ways to do this, like checking the numbers to spot problems (that's called statistical process control or SPC), figuring out what could go wrong and how bad it would be (failure mode and effects analysis or FMEA), and finding the root of a problem when something's not right (root cause analysis or RCA). They're always trying to make these checks better so they can make things more accurately and throw away less.

Several trends regarding various aspects of modern manufacturing are the following:

- Product variety and complexity continues to increase.
- Markets continue to become multinational and global competition is increasing rapidly.
- Developments continue in the quality of materials and their selection, especially for improved recyclability.
- The most economical and environmentally friendly manufacturing methods are increasingly being pursued, and energy management has become increasingly important.
- Titanium, magnesium, aluminum and fiber-reinforced polymers are increasingly seen as essential technologies for meeting fuel energy efficiency goals in transportation applications [3, p. 59].

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CURRENT ISSUES OF VIRTUAL REALITY IN VARIOUS SPHERES OF HUMAN ACTIVITY

Virtual reality is a remarkable technological achievement that allows you to immerse yourself in a world like the real one, but with many more possibilities. The use of VR allows you to analyze and explore problems for improvement. This proves useful in scientific research, where accuracy and efficiency are the most important factors. This tool is widely used in various fields, from medicine to the military. But despite its benefits, the use of BP raises some pressing issues and challenges.

With the emergence of new technologies, live communication in society is decreasing, and the emergence of virtual reality is exacerbating this problem. People don't notice the difference between the virtual and real worlds, especially if they spend most of their time in an artificial world where there are no wrong paths. The impact of VR inhibits the division of reality into artificial and natural, which changes the way people see the world and the person themselves [1].

There is also the issue of data privacy and security. VR headsets have many cameras and sensors that track body, eye, and facial movements. This data is needed for human interaction with the virtual environment. The information is processed on the device itself, but it can also be transferred to external servers. This can lead to leakage of work-related and personal information. There is a need for privacy mechanisms in VR applications [2].

The role of technology is growing, as is the negative impact on the health of users. A lot of studies have shown that the use of virtual reality can lead to symptoms

that can develop to potential illnesses. Discomfort, nausea, and dizziness may occur. It all depends on the complexity of the movements performed by the user [3]. There are many studies on the impact of this problem on VR use and ways to solve it.

Therefore, the development of virtual reality today requires better optimization and improvement for comfortable use. There is a need for a systematic approach to solving various technical challenges. Only by combining theoretical research with practical experiments can problems be overcome, and a real world of technology be created.

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