SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

Proceedings of the International Conference

Date: June 4

Beijing, China 2025

上合组织国家的科学研究：协同和一体化
国际会议

参与者的英文报告

International Conference
“Scientific research of the SCO countries: synergy and integration”

Part 2

2025年6月4日，中国北京
June 4, 2025. Beijing, PRC

Proceedings of the International Conference
“Scientific research of the SCO countries: synergy and integration” - Reports in English

(June 4, 2025. Beijing, PRC)

DOI 10.34660/conf.2025.14.25.064

这些会议文集结合了会议的材料 – 研究论文和科学工作者的论文报告。 它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。
作者对所引用的出版物，事实，数字，引用，统计数据，专有名称和其他信息的准确性负责

These Conference Proceedings combine materials of the conference – research papers and thesis reports of scientific workers. They examine technical, juridical and sociological aspects of research issues. Some articles deal with theoretical and methodological approaches and principles of research questions of personality professionalization.

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

DOI 10.34660/conf.2025.14.25.064 ©Scientific publishing house Infinity, 2025
©Group of authors, 2025

CONTENTS

INTERNATIONAL RELATIONS

PEDAGOGICAL SCIENCES

PHILOLOGICAL SCIENCES

PHILOSOPHICAL SCIENCES

HISTORICAL SCIENCES

ART HISTORY

TECHNICAL SCIENCES

EARTH SCIENCES

DOI 10.34660/INF.2025.88.57.140

建筑业的现代智力成果
MODERN INTELLECTUAL ACHIEVEMENTS IN THE CONSTRUCTION INDUSTRY

Barseghyan Anzhela Alesha
Candidate of Economic Sciences, Associate Professor
National University of Architecture and Construction of Armenia

注释：建筑业作为现代国家经济的一个分支，对国家经济、社会发展和基础设施建设具有重要的意义和影响。它涵盖住宅、商业、工业、基础设施（道路、桥梁、供水、供电）以及其他设施的建设。建筑业不仅创造物质价值，还促进就业、经济增长和生活质量的提高。

关键词：建筑业、基础设施、国内生产总值、人工智能、效率、创新与技术、现代建筑的创造力与安全性。

Annotation. *Construction, as a branch of the economy of a modern state, has an important meaning and influence on the country's economy, its social development and the formation of infrastructure. It includes the construction of residential, commercial, industrial, infrastructure (roads, bridges, water supply, electricity supply) and other objects. Construction not only creates material values, but also contributes to employment, economic growth and improved quality of life.*

Keywords: *Construction, infrastructure, gross domestic product, artificial intelligence, efficiency innovation and technology, creativity and safety of modern construction.*

The main components of construction in a modern state are housing construction. It is aimed at meeting the needs of the population for housing. This includes the construction of apartment buildings, private houses and other residential facilities. This sector often receives government support, especially through social housing programs. However, commercial and public construction plays an important role in the country's economy. This category includes shopping centers, office buildings, hotels, cultural and sports facilities. This construction contributes to the development of business and the promotion of tourism. As for industrial construction, i.e., industrial construction facilities (factories, production centers, warehouses) are important for increasing the country's production capacity. This contributes to the growth of production, the creation of jobs and the expansion of export opportunities. Infrastructure construction contributes to the development

of infrastructure (roads, bridges, railways, airports, energy systems), is crucial for economic growth and connectivity. It also helps strengthen ties between regions. In recent years, much attention has been paid to green construction, which includes the use of energy-efficient technologies, green construction, compliance with environmental standards.

The economic importance of construction is primarily due to GDP growth. Construction requires large investments and directly affects GDP growth. It also stimulates the development of other sectors, such as material production, transport and services. Construction creates jobs both directly (builders, engineers) and indirectly (suppliers, transport companies). It attracts domestic and foreign investment, which contributes to the economic development of the country. The construction of housing and infrastructure improves the standard of living and social conditions of the population.

Along with all the above advantages, construction has a number of serious and large-scale problems:

1. Financing, since construction requires large financial resources, and its financing often becomes an obstacle to many key issues.

2. Adjustment of this industry, since in the construction sector it is important to maintain a legislative and regulatory framework to prevent corruption and illegal construction.

3. Environmental impact, construction may have a negative impact on the environment, so it is important to comply with environmental standards.

In recent years, the construction industry has been developing thanks to technological and intellectual innovations. Today, construction is not only physical labor, but also the result of the use of high technologies and intelligent systems. In this article, we will look at modern intellectual achievements in the construction industry that are changing the future of this industry.

Construction robots are becoming an integral part of construction sites. These robots can perform complex and dangerous tasks such as laying bricks, pouring concrete, and even assembling metal structures. For example, automated robots such as SAM (**Semi-Automated Mason**) are already used in bricklaying, which significantly speeds up the construction process.

Name of the robot	Application	Efficiency	Example
SAM (Semi-Automated Masonry)	Brickwork	Speeds up work by 3-5 times	Used in the USA for the construction of residential buildings.
TyBot	Weaving meshes for concrete reinforcement	Reduces time by 50%	Used in the construction of large bridges.
ERO	Concrete demolition and recycling	Reduce waste by 90%	Used in the reconstruction of buildings in Europe

The use of construction robots is growing rapidly, transforming the construction industry and improving efficiency, safety, and accuracy. Here are the main reasons and benefits of the growing use of construction robots:

1. Increased efficiency

• Construction robots can work continuously without getting tired, which significantly reduces the time it takes to complete projects.

• They can perform repetitive and labor-intensive tasks faster than humans.

2. Security improvements

• Construction is a dangerous industry, and the use of robots can reduce the risk of accidents and injuries when performing dangerous tasks such as working at heights or moving heavy objects.

3. Accuracy and quality

• Robots can provide high precision, which is especially important for complex structures and design elements.

• They can reduce the human factor, which improves the overall quality of construction.

4. Cost reduction

• Although the initial investment may be high, using robots can reduce long-term costs by reducing labor costs and material waste.

5. Overcoming labor shortages

• With labor shortages in the construction industry, robots can fill the gap, ensuring projects are completed on time.

6. Integration of innovations and technologies

• Robots are often integrated with other technologies such as 3D printing, artificial intelligence and the Internet of Things, allowing for more innovative and complex designs.

7. Stability

• Robots can be used in green construction practices, reducing waste and optimising the use of materials, thereby helping to preserve the environment.

8. Decentralized production

• Construction robots are often used for decentralized manufacturing, where structural elements are manufactured in a factory and then transported to the construction site. This approach improves quality and reduces the amount of work on the construction site.

9. Future trends

• The use of construction robots is expected to continue to grow in the future due to technological advancements and the emergence of more affordable solutions.

• Autonomous robots and the integration of artificial intelligence can further improve construction processes.

The growing development of robotics, artificial intelligence, and machine learning is revolutionizing not only e-commerce in supply chains and customer-facing interfaces. Intelligent robotic picking systems are equipped with a range of complex sensors, advanced motion and grip planning, and computer vision. Robots can handle anything by adjusting their angle, speed, grip, or suction power. Every year, the use of robotics in various construction processes is expanding. The main areas are the destruction of buildings and structures. There are also attempts to use robots to build walls and other structures, both from discrete materials and using the 3D printing approach. Remotely controlled robots are a way to facilitate manual labor at a construction site, save on the wage fund, increase labor productivity, and in some cases, its quality.

The use of robots in construction continues to transform the industry, making it more efficient, safer, and more sustainable. The development of these technologies has the potential to revolutionize the construction industry and open up new opportunities.

The rise of construction robots worldwide, according to data

Year	Number of buildings
2020	500
2021	750
2022	1200
2023	2000
2024	3000
2050	13000

The world's population is expected to reach 9.7 billion by 2050. According to Autodesk analytics, about 13,000 new buildings must be built every day to meet the needs of a growing population. Technology can be one way to address the labor shortage and help build the necessary number of buildings.

Despite implementation challenges, the AI construction market, which was estimated to be worth $1.5 billion in 2022, is set to grow more dollars, is expected to grow to $15.1 billion by 2032. This is driven by AI's ability to reduce construction time and costs, promising a smarter, safer, and more efficient future for the construction industry worldwide.

3D printing has revolutionized the construction industry. The technology allows for the rapid and efficient creation of complex structures. For example, ICON uses 3D printing to build apartments for low-income families. This method not only reduces construction time, but also reduces material waste.

Organization	Application	Result	Example
ICON	Construction of apartments	Design of an apartment of 75 square meters in 1 day	More than 100 apartments built in the USA and Mexico
Apis Cor	Building design	Design of 38 sq.m. in 2 hours	The first 3D house built in Russia
COBOD	Design of multi-storey buildings	Design of a 2-storey building in 1 week	First 3D multi-storey building built in Germany

Buildings constructed using 3D printing offer a number of benefits and efficiencies that change traditional approaches to construction. Here are the main benefits:

• Rapid construction: the ability to construct buildings much faster than traditional methods. For example, small structures can be built in a matter of days.

• Reduced labor costs: The automated process reduces human involvement and shortens construction time.

• Efficient use of materials: allows for maximum efficient use of materials, reducing waste.

• Labor savings: The automated process reduces labor costs as fewer human resources are required.

• Complex shapes: creation of complex and non-standard shapes that are difficult or impossible to create using traditional methods.

• Customization: Custom designs can be easily created to suit customer requirements.

• Sustainability: 3D printing can use eco-friendly materials such as biocomposites or recycled materials.

• Reduced waste: Using the right materials reduces construction waste.

• Reduced risks: The automated process reduces the risk of accidents and injuries on the construction site.

• High accuracy, which reduces the likelihood of errors.

• Innovations in the construction industry that open up new opportunities.

• Integration with other technologies can be combined with other technologies such as robotics and artificial intelligence to create more complex and intelligent structures.

• Rapid response: During natural disasters, 3D printing can be used to quickly build shelters, which is important in emergency situations.

• Mobility: 3D printers can be moved to different locations, making it easy to build in remote or hard to reach areas.

Number of buildings constructed using 3D printing:

Year	Number of buildings
2020	50
2021	150
2022	400
2023	800
2024	1200
2037	2700

BIM (Building Information Modeling) technology is a powerful tool for managing and designing construction projects. It allows you to create a digital model of a building that includes all the information: from materials to all the structural elements. Using BIM allows you to reduce errors, improve collaboration and optimize the construction process.

Program	Application	Efficiency	Example
Autodesk Revit	Engineering, design and management	Reduces errors by 20%	Construction of London's Shard skyscraper
ArchiCAD	Building modeling	Reduces design time by 30%	Construction of the Louis Vuitton Foundation Museum in Paris
Navisworks	Project coordination	Reduces collisions by 40%	Construction of the Burj Khalifa skyscraper in Dubai

The rise of BIM in construction companies

Year	Number of buildings
2020	30%
2021	45%
2022	60%
2023	75%
2024	85%

BIM (Building Information Modeling) technology makes an important contribution to the construction industry, as it enables the creation of digital models of buildings and structures containing various types of information: from architectural designs to engineering calculations and operational data. The use of this technology in construction has a number of needs and advantages, which can be summarized as follows:

As needed:

1. Managing complex projects. Modern construction projects are often complex and require the coordinated work of many specialists. BIM allows you to combine data from all specialties on one platform.

2. Accurate planning. BIM enables the creation of accurate digital models that help avoid errors and inconsistencies during the design and construction stages.
3. Saving time and resources. Using BIM reduces design and construction time and reduces inefficient use of materials and labor.

As an advantage:

1. Improved collaboration. BIM allows all professionals (architects, engineers, builders) to work on the same model, which improves collaboration and reduces communication problems.

2. Reduced conflicts. Using BIM allows potential conflicts to be identified and resolved at the design stage before they become problems during construction.

3. Visualization. BIM allows you to create 3D models that make it easier to understand the project and make decisions.

4. Sustainability and energy efficiency. Using BIM allows for the analysis of a building's energy efficiency and sustainability at the design stage, which contributes to more sustainable and environmentally friendly construction.

5. Operations and Maintenance Management: BIM contains information that can be used in the operation and maintenance of the building, which reduces long-term costs.

Artificial intelligence and machine learning are used to manage construction projects, optimize resources, and predict risks. AI can analyze large amounts of data to predict problems that may arise during construction and suggest solutions. For example, Autodesk's AI-powered tools help construction companies predict project completion dates and budgets.

Program	Application	Efficiency	Example
Autodesk BIM 360	Risk Forecasting	Reduces risks by 25%	Large-scale project management in the USA
ALICE Technologies	Project optimization	Reduces costs by 15%	Construction of the San Francisco Subway
Buildots	Construction site monitoring	Reduces latency by 20%	Construction of apartment buildings in Israel

Autodesk and AI-powered tools play a vital role in modern technology and design. Using these tools brings many benefits, as well as increased efficiency and innovation. Here are the key points:

1. Increased efficiency

• Automation: AI-based tools can automate repetitive and labor-intensive processes such as data processing, modeling, and simulation.

• Save time: Autodesk programs such as AutoCAD, Revit, and Fusion 360 use AI to speed up the design and analysis processes.

2. Design accuracy

• Reduced errors: AI can detect and correct errors that might go unnoticed by humans.

• Forecasts: AI-based tools can predict potential problems and suggest solutions based on historical data and analysis.

3. Innovation and creativity

• Generative design: Autodesk tools like Fusion 360 use generative design technologies to create optimal designs based on given parameters.

• Virtual and augmented reality. AI and Autodesk solutions enable the creation of virtual and augmented reality models, making projects more interactive and realistic.

4. Cost reduction

• Resource optimization: AI helps optimize the use of materials and resources, reducing waste and costs.

• Forecasting: Artificial intelligence-based tools allow you to forecast demand and optimize production processes.

5. Leadership and cooperation

• Cloud Solutions: Autodesk cloud solutions like BIM 360 and A360 enable teams to work together regardless of location.

• Data analytics: AI helps analyze large amounts of data and make informed decisions.

6. Planned industry

• Productive Maintenance: AI can predict equipment failures and schedule maintenance work, preventing unplanned downtime.

• Robotics: Autodesk solutions integrate with robotics to automate manufacturing processes.

7. Sustainability and ecology

• Eco-friendly design: AI helps create energy-efficient and eco-friendly designs, reducing environmental impact.

• Resource management: AI-powered tools help optimize resource use, reducing environmental impact.

Drones have become an indispensable tool in the construction industry. They are used to survey, monitor, and collect data on construction sites. Drones can quickly and accurately create 3D maps of construction sites, which can improve project planning and management.

Drone type	Application	Efficiency	Example
DJI Phantom 4 RTK	Construction site mapping	Reduces time by 50%	Monitoring major projects in China
Parrot Anafi USA	Construction inspection	Reduces risk by 70%	Bridge inspection in the USA
Skydio 2	Creation of 3D models	Reduces costs by 30%	Mining Construction in Canada

Indeed, drones have become an important tool in the construction industry in recent years due to their versatility, efficiency, and safety. Here are some of the benefits that drones bring to construction:

1. When surveying and mapping terrain, drones allow you to quickly and accurately survey construction sites, create 3D models and maps. This is especially useful in large areas and hard-to-reach places.

2. For safety purposes, drones can be used to perform work in dangerous or hard-to-reach places, reducing the risk to people. For example, they can check the condition of structures or monitor the progress of construction.

3. To save time and money, drones can automate construction processes, saving time and labor. They also allow for rapid data collection that can be used for decision making.

4. For the purpose of general construction control, drones are used to monitor construction sites, ensuring that work is carried out according to plan. They can also be used to monitor material stocks.

5. In marketing and presentation, drones can be used to create videos and photos showing the progress of construction projects. This is useful for communicating with investors and clients.

Sustainability is becoming a priority in the construction industry. Green technologies such as energy-efficient materials and renewable energy sources are used in the construction of buildings. For example, the Passivhaus standard requires the construction of buildings that consume a minimum amount of energy while providing a high level of energy efficiency.

The Passivhaus standard plays an important role in the construction industry, focusing on energy efficiency, environmental sustainability and ensuring a high standard of living. Modern construction offers design and construction methods that minimize energy consumption while maintaining a comfortable indoor climate.

Technology	Application	Result	Example
Passive house	Energy efficient buildings	Reduces energy consumption by 90%	Residential buildings built in Germany
LEED (Leadership in Energy and Environmental Design)	Green Building Standard	Reduces carbon emissions by 30%	One Bryant Park building in the USA
BREEAM (Building Research Establishment Environmental Assessment Method)	Environmental assessment of buildings	Reduces water consumption by 40%	The Gherkin building in the UK

This standard has gained global recognition and is used in the construction of residential, public and commercial buildings, contributing to a sustainable future.

Conclusions: Thus, based on information on the use and implementation of such technology as artificial intelligence in the construction industry, the following conclusions can be drawn:

- progress in the development of innovations to improve the quality and efficiency of work is subject to critical review and revision on a daily basis, which has a positive impact on the prospects for the modernization of modern technologies;
- the global scientific community is actively advancing and delving into the study of technologies that can change humanity with their capabilities;
- Artificial intelligence is a technology with a promising future, it has advantages and disadvantages that can be brought to a single positive result through labor-intensive and persistent work on deep learning and competent implementation in human life;
- The efficiency of the performance of artificial intelligence technology in the applied areas of work successfully demonstrates itself, demonstrating high rates of performance of assigned tasks.

Conclusion: Construction is one of the main sectors of economic development of a modern state. It contributes to economic growth, job creation and improvement of quality of life. However, effective management, investment and maintenance of ecological balance are necessary for achieving success.

Modern intelligent advances in the construction industry are changing the future of the industry. Robots, 3D printing, BIM, artificial intelligence, drones and green technologies are becoming the keys to success in construction. These innovations not only increase the efficiency of the construction process, but also contribute to environmental protection and sustainable development.

Buildings constructed using 3D printing offer numerous benefits, including speed, cost savings, design flexibility, sustainability, and safety. This technology has the potential to change the future of construction, making it more efficient and sustainable.

BIM technology is an indispensable tool in the construction industry, improving all stages of design, construction and operation. It helps save time, resources and costs, as well as improve the quality and efficiency of construction projects.

Using Autodesk and AI-powered tools increases efficiency, reduces costs, drives innovation, and ensures sustainability. These technologies are becoming indispensable in today's manufacturing and design industries, enabling competitiveness and growth.

References

1. Pan Y., Zhang L. Roles of artificial intelligence in construction engineering and management: A critical review and future trends // Automation in Construction. 2021. V. 122. Art. 103517. DOI: 10.1016/j.autcon.2020.103517

2. Abioye S.O., Oyedele L.O., Akanbi L., Ajayi A., Delgado JMD, Bilal M., Olugbenga O.A., Ahmed A. Artificial intelligence in the construction industry: A review of present status, opportunities and future challenges // Journal of Building Engineering. 2021. V. 44. Art.103299. DOI: 10.1016/j.jobe.2021.103299

3. Sacks R., Girolami M., Brilakis I. Building information modeling, artificial intelligence and construction tech // Developments in the Built Environment. 2020. V. 4. Art.100011. DOI: 10.1016/j.dibe.2020.100011

4. Kashiripour M.M., Garagozov S.B. New trends and innovations in construction: construction using a 3D printer // Engineering and Economics: Current State and Development Prospects: Collection of materials from the student scientific and technical conference within the framework of the 20th International Scientific and Technical Conference of BNTU «Science - for Education, Production and Economy» and the 78th student scientific and technical conference of BNTU, May 4-5, 2022 / ed. board: O.S. Golubova [et al.]; compiled by N.A. Pashkevich. Minsk: BNTU, 2022. Pp. 94-99. URL:https://rep.bntu.by/handle/data/114413

5. Gromovskaya E.A. Improving Personnel Safety in Production Through the Implementation of Artificial Intelligence // Bulletin of the Magistracy. 2022. No. 12-5 (135). URL: https://cyberleninka.ru/article/n/povyshenie-bezopasnosti-personala-na-proizvodstve-za-schetvnedreniya-iskusstvennogo-intellekta/viewer (accessed: 10/26/2023).

6. Smart construction: how artificial intelligence can improve safety at construction sites // NEWS.am TECH – Innovations and Science. URL: (accessed: 29.10.2023). https://tech.news.am/rus/print/1026/

7. Artificial Intelligence in Construction: 7 Ready-to-Use AI Applications in Construction // ELport.ru: business portal. URL:https://elport.ru/articles/iskusstvennyiy intellekt_v_stroitelstve_7_gotovyih_k_rabote_ii-prilojeniy_v_stroitelstve (date of access: 24.10.2023).

DOI 10.34660/INF.2025.58.30.141

未利用农用地流转中农用地利用组织的问题与特点（基于彼尔姆州材料）
PROBLEMS **AND FEATURES OF THE ORGANIZATION OF AGRICULTURAL LAND USE WHEN INVOLVING UNUSED AGRICULTURAL LAND IN CIRCULATION (BASED ON MATERIALS FROM THE PERM REGION)**

Zhelyaskov Alexander Lyubomirovich
Candidate of Economic Sciences, Associate Professor
Perm State Agrarian-Technological University named after Academician D.N. Pryanishnikov

摘要。本文探讨了当前的任务之一——未利用农地的流转，并指出了由于市辖区内农地数量增加而导致的农地利用组织方面的问题。本文对农村地区的经济、人口和其他可能性进行了分析，并评估了未开垦土地参与经济流转的可能性。证明了制定与土地再分配相关的农业部门长期发展的必要性。本文还提出了制定此类计划的具体建议。

关键词：农地利用、未利用农地、土地参与经济流转、未开垦土地、农村地区、农业生产。

Abstracttion. *One of the current tasks is considered – the involvement of unused agricultural lands in circulation, problems arising in the organization of agricultural land use as a result of the increase in agricultural lands within the boundaries of municipalities are identified. An analysis of economic, demographic, and other possibilities of rural areas is conducted and an assessment is given of the possibility of involving uncultivated lands in economic circulation. The need to develop long-term programs for the development of the agricultural sector in connection with the redistribution of lands is proved. Specific proposals aimed at developing such programs are given.*

Keywords: *agricultural land use, unused agricultural land, land inclusion in economic circulation, uncultivated land, rural areas, agricultural production.*

In a number of subjects of the Russian Federation in recent decades there has been a steady trend towards a reduction in the area of cultivated agricultural land. This process, which began at the end of the last century, is associated with the political, economic and social transformations of that period. The land reform that began in the country has radically changed the attitude towards land ownership and the organization of agricultural production.

The problem of using abandoned and uncultivated lands is usually viewed from one point of view - the fastest and most urgent return of abandoned lands to agricultural production. As a rule, the need to involve them in circulation is not in doubt and is not discussed. Only organizational problems and mechanisms of involvement are discussed. However, the stated goal of returning lands that have been withdrawn from circulation is not unambiguous. There are a number of reasons why the opinion about the undisputed involvement of abandoned lands in circulation in a number of regions is met with a certain degree of caution. The problem is widely discussed in the scientific community. Almost all researchers agree with the need to return areas that have been withdrawn from circulation to the agricultural sector. More than 30 years have passed since the emergence of abandoned lands. Many regions have coped with this problem, in a number of others it is only getting worse. For example, in the Perm Territory and other subjects of the Non-Black Earth Zone of Russia, the area of unused lands continues to increase. Against this background, lands are overgrown with forests and bushes, and lands are degrading. The areas of overgrowth are measured in tens of millions of hectares. It is obvious that the regions themselves will not be able to cope with this problem; state support for this expensive measure is needed. Only with state support can tangible results be achieved. S.N. Volkov [1], conducting a deep analysis of the current state of land use in the country, notes the irretrievable loss of part of the arable land withdrawn from circulation, the widespread manifestation of negative phenomena on unused land. The way out of this situation is seen in the implementation State program for the effective involvement of agricultural lands into circulation and the development of the melioration complex of the Russian Federation [2]. The program provides return into the composition of cultivated agricultural lands with an area of at least 13.2 million hectares by the end of 2030, which will ensure the creation of 60.7 thousand additional jobs places in the field of agriculture. Many scientists involved in the use of land resources agree with the need for a preliminary land survey [3, 4,5]. Unfortunately, today many territorial offices of Rosreestr and the Ministry of Agriculture of the constituent entities of the Federation cannot answer the question of the quality and location of unused land. There is no unified system or even methodology for keeping records of lands that are being withdrawn from circulation, overgrown with forests and degrading lands. The size of abandoned areas is an estimate. Many scientists - economists rightly claim that the active involvement of abandoned lands in circulation will contribute to the development of the land market, the growth of agricultural production in the regions, an increase in agricultural exports, the achievement of food security and the sustainable development of rural areas. On the one hand, this is indeed true, but these statements should be examined in more detail.

First of all, the inclusion of unused lands into circulation is possible only under certain conditions. Thus, the increase in arable land areas will create economic and

social problems in a number of subjects of the Russian Federation. This primarily applies to those regions where the reduction in sown areas amounted to more than 40%.

Therefore, the re-involvement of lands that have been withdrawn from circulation does not seem to be indisputable. Yes, it is possible to simultaneously plough large areas, spending a significant amount of material resources. But whether it will be possible to maintain these lands in proper condition is a question that raises great doubts.

In order to talk about the need to involve unused lands into circulation, it is necessary to understand the purpose of this involvement, as well as to imagine the cost of the planned activities, the availability of labor resources capable of ensuring the implementation of the activities. Often, the goals and objectives of the development of the agro-industrial complex and the system of activities aimed at expanding areas are not connected in any way.

It seems that large-scale programs aimed at increasing the area of agricultural land should be implemented in parallel with agricultural development programs and integrated territorial development programs.

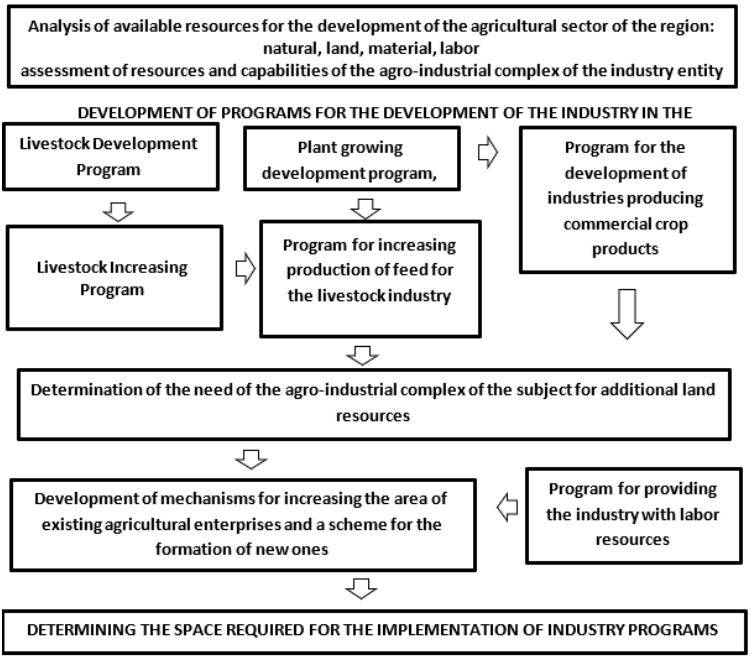


Figure. *Algorithm for determining the need for additional agricultural land areas for the development of the agricultural sector of a constituent entity of the Russian Federation.*

Regional programs should answer the question of how much agricultural land can be cultivated given the current state of the agricultural sector, the availability of labor and material resources, the current state of technology, the state of livestock farming, the availability and condition of livestock facilities that meet today's demands, and many others.

The implementation of the algorithm shown in the figure should precede the development of a land management scheme for a constituent entity of the Russian Federation. economy. Currently, the approved strategies for the development of the agro-industrial complex of the Perm region for the period up to 2035The industry's attractiveness for investors has been announced to be growing. At the same time, the Program devotes several lines to the analysis and prospects for the use of the region's land resources. If we agree that existing agricultural organizations do not feel the need for additional agricultural land. Then programs to bring unused land into circulation do not make sense and it is unclear why they are planned to be carried outwork to increase the area of agricultural land in the Perm region. In the Perm region, more than one million hectares have been withdrawn from agricultural production. Involving them in circulation will require radical changes in the organization of agricultural production.

Table 1

Dynamics of use and involvement of arable land in the Perm region (2017-2023)

Indicators	years						
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Arable land area, total, thousand hectares	1788,5	1794.8	1794.6	1794.3	1794.2	1784.4	1782.3
incl. unused, thousand hectares	1000,6	1021.2	1011.6	1012,1	976.05	1022.3	1077.7
Proportion of unused arable land, %	55.9	56.90	56.37	56.40	54.0	60.5	60.45
Area of arable land involved in circulation, thousand hectares	30.15	15.86	4.2	4.1	1.95	10.1	7.5
The share of arable land involved in circulation, %	3.0	1.5	0.4	0.4	0.3	0.5	0.7

In order to carry out such a gigantic task, it is necessary to answer the question: for what purpose will hundreds of thousands of hectares of land be returned to circulation? At the same time, the situation that has developed in the agro-industrial complex of the region does not inspire optimism and requires immediate development of programs for the development of the industry. Therefore, additional

areas that may appear on the basis of Government Resolution No. 731 should be in demand by existing agricultural organizations. The data presented in Table 2 testify to the current situation in the agricultural sector of Perm Krai.

Table 2

Comparative characteristics of indicators characterizing the size of the agricultural sector of the Perm Territory (1991 and 2024)

	Indicators	years		Change in the indicator in the initial year, %
		1991	2024	
	Cultivated area, thousand hectares	1830	705	-72.1
	Number of cattle in agricultural enterprises of all types, thousand heads	875.7	209.4	-76.1
	Number of workers employed inagriculture and forestry,thousand people	61.74	14.86	-75.9
	Number of agricultural enterprises, units	451	212	-50.8

The reduction of almost all indicators of production in the agricultural sector during the analyzed period indicates that the involvement of additional areas in circulation must be preceded by extensive organizational work, accompanied by the development of a strategy for the development of the agricultural sector of the region.

The activities carried out by the regional Office of Rosreestr, based on the data of Rosselkhozmonitoring in Perm Krai, allowed to record 219 thousand hectares of land out of a million hectares of idle land. Of these, almost 130 thousand hectares are suitable for inclusion in agricultural turnover, 65 thousand hectares are partially suitable. Naturally, work in this direction must be continued. There are significant differences in the data provided by Rosreestr from the data provided the reports of the Ministry of Agriculture of the Russian Federation on the status and use of agricultural land in the country [6] differ from those presented by the territorial office of Rosreestr for Perm Krai.

According to published data, the current rate of inclusion into circulation will allow achieving full use of arable land only in 140-150 years. It is well known that in the Perm region failure to use agricultural land for more than 5 years leads to active overgrowth with shrubs and forests.

Of course, Perm Krai has enormous land potential. Including unused areas into circulation would significantly increase the volume of agricultural production, bring the industry to a completely different quality level. However, the question of upcoming capital investments in the industry and the issue of attracting labor resources inevitably arises.

It seems that the upcoming involvement of overgrown and degraded lands in circulation is comparable in scale and complexity to the development of virgin and fallow lands carried out in our country in the middle of the last century.

The conducted analysis allows to build a model and determine the sequence of actions within the boundaries of the subject, to present the enlarged costs of the event implementation. According to the available data, there are 130 thousand hectares of agricultural land in the Perm Territory, suitable for return to agricultural production. The sequence of calculation of the volumes and cost of implementation of the main events aimed at ensuring the use of lands involved should be built according to the following algorithm:

- performance of works on clearing forests and bushes on an area of 130 thousand hectares, carrying out melioration measures, applying fertilizers, etc. Costs will amount to 350 to 600 million rubles.

- development of projects on formation of new large agricultural organizations in the territory of the region. It is well known that successfully operating enterprises in the territory of the region have agricultural land areas from 3.0 to 5.5 thousand hectares. Thus, it is necessary to create 30 - 40 large agricultural organizations.

- purchase of breeding cattle for each newly formed business entity. The total number of livestock will be 50-55 thousand heads of cattle. The total cost will be from 3.75 to 4.5 billion rubles

- with construction of livestock farms and complexes from 200 to 220 objects, for a total amount30-40 billion rubles.

- acquisition5.2-5.5 thousand tractors, 850-900 grain harvesters, 2.0 - 2.2 thousand ploughs and cultivators, forage harvesters, forage harvesting equipment, construction of 300-350 grain drying complexes. The total cost of their acquisition may amount to 30-40 billion roubles. It is also necessary to add the cost of building residential buildings to attract workers to rural areas, creating social, transport, engineering and other infrastructure facilities, and new business centres.

It seems that this important and very necessary work should be carried out with the support and under the control of the state, with state financing or co-financing. Large-scale work on involving unused lands into circulation should be preceded by the development of forecasts, schemes and projects for the organization of agricultural lands within the boundaries of both subjects and for each municipality.

References

1. Volkov S. N. On the need for land management support for the involvement of unused agricultural lands in agricultural circulation in the Russian Federation, pp. 201-209// Journal "Land Management, Cadastre and Land Monitoring" Vol. 19, No. 4 (231) April / 2024

2. Khlystun V.N., Alakoz V.V. On state regulation of agricultural land use / Fertility. 2022. No. 3 (126). P. 61-67.

3. Lipsky S.A. Analysis of the reasons for the adoption of the State Program for the Involvement of Abandoned Lands into Circulation and the Progress of its Implementation // Journal of Land Management, Cadastre and Land Monitoring Vol. 20, No. 1 (240), 2025

4. Zhelyaskov A.L. Geoinformation and cadastral support for the inclusion of unused lands into circulation // Proceedings of the international scientific and practical conference "Actual problems of development in the field of geodesy, cartography, cadastre and spatial data" International Scientific and Practical Conference, Collection of Articles (April 15-16, 2025. SamSACU), p. 273-277

5. Resolution of the Government of the Russian Federation of May 14, 2021 N 731 "On the State Program for the Effective Involvement of Agricultural Lands into Circulation and the Development of the Land Reclamation Complex of the Russian Federation" (with amendments and additions)https://base.garant.ru/400773886/?ysclid=ma45klnfmc289374151—Date of access: 19.01.2024.

6. Report on the status and use of agricultural lands of the Russian Federation in 2023 -M.: FGBNU "Rosinformagrotech", 2024. - 414 p.

DOI 10.34660/INF.2025.26.26.142

数字技术在改进税务管理体系中的作用
THE ROLE OF DIGITAL TECHNOLOGIES IN IMPROVING TAX ADMINISTRATION SYSTEMS

Oblatsova Uliana Vadimovna
Senior Lecturer
Perm State National Research University

摘要：本文探讨了数字技术对俄罗斯联邦税收管理转型的影响。本研究的意义在于，在数字经济发展的背景下，需要提高税收控制效率并减少逃税。

作者分析了联邦税务局 (FTS) 实施的关键自动化系统，包括 Tax-3 AIS 和 VAT-2 ACS，及其对优化税务流程的贡献。本研究的实证部分基于 FTS 的统计数据，该数据表明税收差距显著缩小（从 2015 年的 8% 降至 2024 年的 0.59%），纳税人自愿修改税款的比例有所提高（同期从 11.7% 升至 56%）。

本文特别关注有前景的数字化趋势，尤其是用于提高金融交易透明度的区块链应用。同时，本文还指出了与数字化解决方案相关的系统性风险，包括巨大的财务资源需求、网络安全挑战以及人员技能提升的需求。

研究结果证实，税务管理的数字化转型能够提升税收征管效率，减少影子税务，并提高税收透明度。未来的发展方向包括进一步应用人工智能和大数据处理技术。

关键词：数字化、税务管理、税收、自动化信息系统、税务控制、区块链技术。

Abstract. *This article examines the impact of digital technologies on the transformation of tax administration in the Russian Federation. The relevance of the study stems from the need to enhance tax control efficiency and reduce tax evasion in the context of digital economy development.*

The author analyzes key automated systems implemented by the Federal Tax Service (FTS), including Tax-3 AIS and VAT-2 ACS, and their contribution to optimizing tax processes. The empirical part of the research is based on FTS statistical data demonstrating a significant reduction in the tax gap (from 8% in 2015 to 0.59% in 2024) and an increase in voluntary tax amendments by taxpayers (from 11.7% to 56% during the same period).

Special attention is given to promising digitalization trends, particularly blockchain applications for improving financial transaction transparency. Concurrently, systemic risks associated with digital solutions are identified, including substantial financial resource requirements, cybersecurity challenges, and the need for personnel upskilling.

The research findings confirm that digital transformation of tax administration enhances tax collection, reduces shadow schemes, and fosters greater tax transparency. Future development directions include further implementation of artificial intelligence and big data processing technologies.

Keywords: *digitalization, tax administration, taxes, automated information systems, tax control, blockchain technologies.*

Introduction

The advancement of technologies at the present stage leads to the formation of a new information society. Digitalization affects all spheres of societal and human life. According to M.N. Kondratyeva: «Digitalization is the process of transitioning to digital technologies that permeates all aspects of society, enabling the use of cutting-edge technologies for more efficient operations, as well as facilitating activities that were previously impossible to implement» [1, p. 138].

In the context of rapid digital technology development, their implementation in public administration has become a priority. Digitalization is particularly significant in tax administration, where it optimizes tax collection processes, enhances transparency of tax control, and improves monitoring of tax compliance. This leads to a comprehensive digital transformation of the tax system. Such transformation strengthens control over tax law compliance, enabling prompt detection and prevention of tax evasion.

Tax evasion poses a serious challenge not only to the federal budget but also to regional budgets. It reduces revenues necessary for implementing state socio-economic programs. With growing financial autonomy of regions, the use of digital tools in tax administration gains strategic importance. This is especially relevant for constituent entities of the Russian Federation, where tax discipline and collection rates significantly impact regional economic stability.

In the work of Y.I. Gribanov and A.A. Shatrov, digital transformation is defined as: «The implementation of modern technologies into business processes. This approach involves not only installing contemporary equipment or software but also fundamental changes in management approaches, corporate culture, and external communications. As a result, it increases each employee's productivity and customer satisfaction levels, while establishing the company's reputation as a progressive and modern organization» [2, p. 46]. Thus, digital transformation of the tax system entails not only applying modern methods of data collection and processing but also changing corporate culture and improving communication with taxpayers.

The purpose of this study is to evaluate the impact of digital technologies on tax administration in Russia. The research object is the tax system. The subject of research comprises digital technologies applied in tax administration, such as

the «AIS Tax-3» automated information system and the «ACS VAT-2» analytical platform.

Methods

To achieve the goal of the study, both theoretical and empirical methods were used. The theoretical part is based on the analysis of scientific literature on the use of digital technologies in tax administration, including works on automated information systems, analytical platforms and blockchain technologies. The empirical part includes a statistical analysis of data on tax collection after the introduction of modern technologies in tax administration. Among the key technologies considered in the study, the automated information system «AIS Tax-3» stands out, providing centralized collection and processing of tax information. As well as the analytical platform «ACS VAT-2» for monitoring the payment of value added tax (hereinafter referred to as VAT) and identifying VAT evasion schemes.

Results

An analysis of the performance indicators of the Federal Tax Service of Russia (hereinafter referred to as the FTS) showed that since the introduction of automated systems, the effectiveness of the service's control and analytical work has increased. Thus, according to the report on the results of the control work of tax authorities for 2015, the total number of on-site audits conducted in Russia amounted to 30,662 units, while in 2024 the total number of on-site audits conducted amounted to 4,889 units. Over almost 10 years, the decrease was about 84%, which is a significant result.

Since 2015, the FTS of Russia has been actively using a system to identify illegal schemes to minimize VAT payable. This system, «ACS VAT-2», allows you to automatically build chains of relationships between counterparties based on data from the purchase book and sales book of the VAT tax return. The «ACS VAT-2» system not only works automatically, but also allows tax authorities to work more quickly and efficiently with taxpayers who have identified chains of business relationships with unscrupulous counterparties or with counterparties not conducting real financial and economic activities.

Such automation has allowed not only to reduce the number of on-site inspections, but also to increase additional payments to the budget, which is confirmed by the results of voluntary clarification of control and analytical work. The FTS of Russia is currently aimed at voluntary clarification of tax liabilities by taxpayers in whose activities risky VAT transactions have been identified. According to the automated information system of the FTS - AIS «Tax-3», presented on the official website, the share of voluntary tax payments in the total volume of receipts from control and analytical work for 2024 was 56%, while in 2016 the share was 11.7%.

The efficiency of automated systems implementation is also confirmed by the tax gap indicator, which characterizes the purity of the administered environment.

This indicator is not static and is directly dependent on the intensity of taxpayers' use of tax evasion schemes. In 2015, the share of discrepancies throughout Russia was 8%, while in 2024, the share of discrepancies was 0.59%. Over almost 10 years, the share of discrepancies has decreased to about 7.41%, which also emphasizes the efficiency and feasibility of using digital technologies.

Discussion

The obtained results confirm that digital technologies are quite an effective tool in the fight against tax evasion. Automation of processes and the use of analytical platforms, such as «ACS VAT-2», allow for the prompt identification of violations, which increases tax revenues and strengthens the financial stability of the state. The use of digital technologies in tax administration confirms their importance for increasing the transparency and efficiency of tax processes, however, the business environment is adapting to changes in tax policy, which requires the FTS of Russia to use more modern automation methods.

For example, blockchain technology has unique characteristics that make it a promising tool for combating tax evasion, the authors of the work emphasize [3, p. 78]. Due to the immutability of records and the distributed nature of data storage, blockchain allows for the creation of transparent chains of financial and economic transactions, which complicates the use of one-day firms and other schemes for minimizing tax liabilities. However, the introduction of digital technologies is associated with a number of challenges. Firstly, significant funding is required to develop and support such systems. Secondly, reliable data protection from cyber-attacks is necessary, since information leakage can undermine confidence in the system. Thirdly, the effectiveness of technologies depends on the level of training of tax authorities, which requires large-scale advanced training of personnel.

Despite these limitations, the benefits of digitalization outweigh the drawbacks, creating a basis for further development of tax administration. Prospects lie in the introduction of artificial intelligence and big data, which can improve the accuracy of identifying complex evasion schemes that are inaccessible to traditional methods.

Conclusion

Digital technologies play a decisive role in optimizing tax administration and combating tax evasion in Russia. Their implementation increases transparency, efficiency and tax collection, which is critical for the sustainable development of the state. The results of the analysis show that the AIS Tax-3 and ASC VAT-2 systems reduce tax evasion and increase tax revenues to the budget. For further development, it is necessary to continue investing in digital solutions, ensuring cybersecurity and training personnel. The development of adaptive tax mechanisms and their integration into economic policy will minimize risks and create conditions for sustainable economic growth.

List of references

1. Kondratieva, M. N. Digitalization: a study of the main terms / M. N. Kondratieva, A. V. Komakhina // Economy and Management: scientific and practical. journal. - 2022. - No. 3 (165). - Pp. 25-32. - URL: https://ekam-journal.com/images/2022/3-2022/Kondratieva-Komakhina.pdf (accessed: 27.05.2025). - DOI: 10.34773/EU.2022.3.25. 2. Gribanov, Yu. I. The essence, content and role of digital transformation in the development of economic systems / Yu. I. Gribanov, A. A. Shatrov // Bulletin of the Altai Academy of Economics and Law. - 2019. - No. 3-1. – P. 44–48. – URL: https://vaael.ru/ru/article/view?id=349 (date of access: 28.05.2025).

2. Maksimov, V. P. Use of blockchain technology in tax administration of the Russian Federation / V. P. Maksimov, U. V. Oblatsova // Economic research and development. – 2021. – No. 1. – P. 75–79. – Access mode: https://www.elibrary.ru/item.asp?id=XTLAAZ (date of access: 28.05.2025).

3. Analytical platform of the Federal Tax Service: [official website]. – URL: https://analytic.nalog.gov.ru/ (date of access: 28.05.2025).

4. Digitalization in the Federal Tax Service (FTS) // TAdviser: [electronic. resource]. URL: https://www.tadviser.ru/index.php/Статья:Дизовизация_в_Федеральная_налоговой_служе_(ФНС) (date of access: 28.05.2025).

5. Federal Tax Service: [official website]. – URL: https://www.nalog.gov.ru/rn77/related_activities/statistics_and_analytics/forms/ (date of access: 28.05.2025).

DOI 10.34660/INF.2025.47.90.143

雅库特出口导向型小型液化天然气项目：中俄合作背景下的投资吸引力评估
EXPORT-ORIENTED SMALL-SCALE LNG PROJECTS IN YAKUTIA: AN INVESTMENT ATTRACTIVENESS ASSESSMENT IN THE CONTEXT OF RUSSIA–CHINA COOPERATION

Zhemchuzhin Aleksandr Stanislavovich
Master's student
Rozov Daniil Nikolaevich
Master's student
St. Petersburg State University of Economics

摘要：本文分析了雅库特地区旨在出口至中国的小型液化天然气项目的投资前景。研究强调了延长航行时间、提高产量和外汇收入对于实现正净现值（NPV）的重要性。尽管资本密集度高且存在外部风险，但与中国能源公司合作可以通过投资和承购合同改善财务稳定性。研究结果表明，模块化方法和国际合作可以增强北极地区液化天然气出口的可行性。

关键词：小型液化天然气、雅库特、中俄合作、投资吸引力、净现值、物流、模块化液化天然气工厂、能源出口、风险管理、液化天然气供应链、北海航线。

Abstract. *This article analyzes the investment prospects of small-scale LNG projects in Yakutia aimed at exports to China. The study highlights the importance of extended navigation periods, production volume, and foreign currency revenue for achieving positive NPV. Despite high capital intensity and external risks, partnerships with Chinese energy companies can improve financial stability through investment and offtake contracts. The findings suggest that modular approaches and international cooperation can enhance the viability of LNG exports from Arctic regions.*

Keywords: *Small-scale LNG, Yakutia, China-Russia cooperation, investment attractiveness, NPV, logistics, modular LNG plants, energy exports, risk management, LNG supply chain, Northern Sea Route.*

In recent years, the People's Republic of China has maintained a global leadership position in terms of liquefied natural gas (LNG) import volumes. Domestic energy transition policies and a shift away from coal have contributed to a stable increase in demand. As of today, China's annual LNG imports exceed 70 million tonnes, with projections indicating a stable increase in the future. Under these con-

ditions, Russian small-scale LNG has the potential to occupy a small, yet stable niche in the Chinese market. That becomes increasingly important with the consideration of a current trend of an increased demand on Russian LNG on a Chinese market [1].

The Sakha Republic (Yakutia) possesses some of the largest proven reserves of natural gas in Russia, estimated at over 2 trillion cubic meters, including the Chayandinskoye and Srednevilyuyskoye fields. These fields are already integrated into federal infrastructure projects such as the “Power of Siberia” pipeline, laying the foundation for local gas extraction and LNG production. An additional consideration is the region’s remoteness from centralized energy sources and the consequent need for reliable and compact energy supply solutions. This makes small-scale LNG not only export-oriented but also critical for the sustainable development of the northern territories. The geographic location of Yakutia opens up opportunities for export via Eastern Siberia to China and the broader Asia-Pacific region. Thus, the region combines a rich resource base with strong logistical potential, making it an optimal location for the development of scalable LNG production capacities.

The objective of this study was to conduct a comprehensive assessment of the investment efficiency of a network of small-scale LNG plants in the Sakha Republic, accounting for the specificities of northern regions, logistical constraints, seasonal demand patterns, and potential production volumes. A financial-economic model was developed and supplemented with Monte Carlo simulations to evaluate project robustness under various combinations of key parameters.

The evaluation model was constructed using the following criteria: Sales price ($/t), Exchange rate (RUB/USD), Production cost (RUB/t LNG), Logistics tariff ($/t), Navigation period (months), Volume (tonnes), Project Revenue (RUB), Net Present Value (NPV, RUB).

Key indicators were defined for each criterion. All techincal anf LNG plant related charachteristics were based on [2], [3]. The sales price ranged from $7/MMBtu to $14/MMBtu [4]. Due to exchange rate fluctuations, a wide range of 40 to 150 RUB/USD was used. The logistics tariff, calculated separately, averaged $80 per tonne of LNG; therefore, a variation range of $40 to $120 per tonne was assumed. Production costs varied between 12,000 and 27,000 RUB per tonne, based on [5]. The navigation and transport period was critical due to Yakutia’s harsh climate; seasonal shipping durations from 4 to 12 months were considered.

The Monte Carlo simulation enabled the construction of a resilient financial model for a small-scale LNG project aimed at both northern and export markets. The modeling approach involved wide parameter variation at each stage to assess the project’s sensitivity to shifts in market, logistical, and production conditions. The primary goal was to identify realistic conditions under which the project could achieve positive investment returns and analyze key criteria of a sucessful project.

The simulation results revealed that only 16.9% of modeled scenarios resulted in a positive NPV. This suggests that, under current cost structures and market prices, the likelihood of project profitability is less than one in five. A share this low of profitable scenarios can be attributed to the simultaneous influence of several adverse factors: relatively weak current export prices, the capital-intensive nature of northern infrastructure, and a limited sales market. The average NPV across all scenarios was negative, amounting to approximately −4.25 billion RUB, indicating a predominance of loss-making configurations within the defined assumptions.

Despite the overall unfavorable picture, the profitable scenarios exhibited internal consistency. The average ROI for these configurations was 1.25, implying that under favorable conditions, the project could yield a return of 25% on invested capital, which falls in the range depicted in [3]. These scenarios were characterized by sale prices near the upper end of the range (13–14 $/MMBtu), an exchange rate above 100 RUB/USD, and a maximum navigation period. This combination of factors allowed compensation for high capital and variable costs.

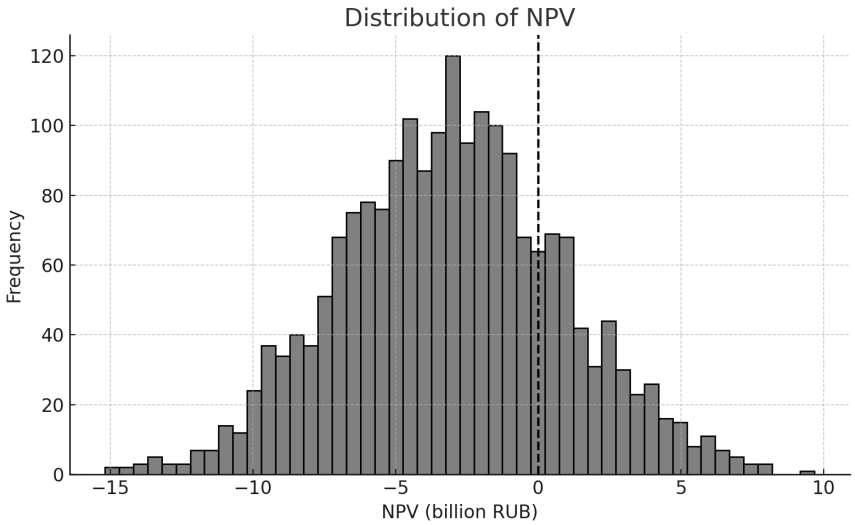


Figure 1. *Distribution of NPV across scenarios*

A break-even analysis using linear regression identified the minimum annual sales volume required for the project to achieve a zero NPV. This threshold was approximately 78,000 tonnes per year, nearly the full production capacity of a standard modular plant. Hence, the project demonstrates high sensitivity to

underutilization and necessitates stable demand throughout the entire navigable period. Any deviations from the sales plan—such as logistical delays, disruptions in export contracts, or seasonal restrictions—directly diminish investment attractiveness.

In addition to volume, the exchange rate exerts a significant influence on the outcome. All else being equal, a weaker ruble significantly boosts export revenue in RUB terms. Thus, exchange rate volatility constitutes a critical risk management factor. With RUB/USD fluctuations ranging between 60 and 120, revenue differentials can reach several dozen percentage points. To improve resilience, currency risk hedging mechanisms or partial cost localization in foreign currency may be employed.

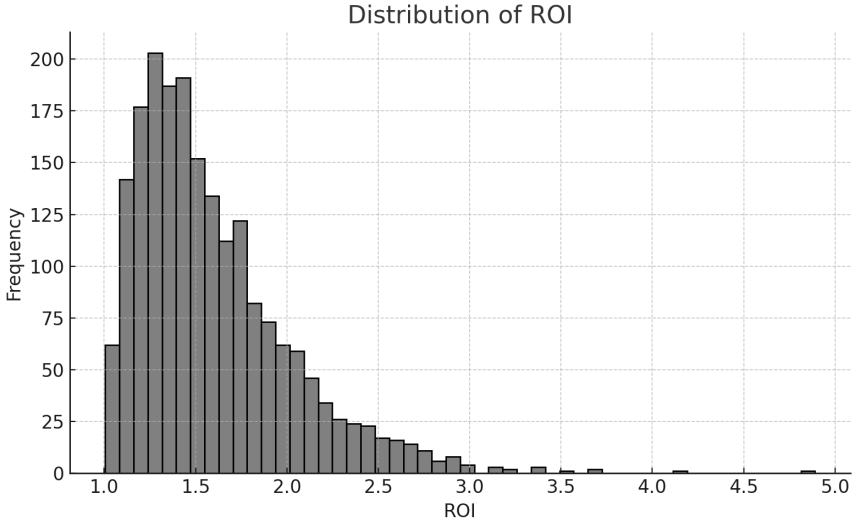


Figure 2. *ROI Distribution for Profitable Scenarios*

The capacity to earn revenue in USD or CNY under a weak ruble regime significantly enhances ruble-denominated earnings. For example, at an exchange rate of 100 RUB/USD, selling 100,000 tonnes of LNG at $13/MMBtu could generate over 6.8 billion RUB—2 to 2.5 times higher than under rates of 40–50 RUB/USD. This is particularly critical for high-cost northern projects, where expenditures are in RUB and revenues in foreign currency. The financial model confirmed the high sensitivity of NPV to exchange rate dynamics. Ruble depreciation most strongly increases the probability of achieving a positive NPV, making currency risk not only a source of uncertainty but also a potential profitability lever, Ceteris Paribus.

The use of hedging instruments, including forward contracts or currency options, could enhance project resilience against sharp rate fluctuations.

Additionally, transactions with Chinese partners are increasingly denominated in Yuan rather than USD, reducing dependence on Western financial systems. Given current exchange rate dynamics and geopolitical factors, targeting foreign currency revenue emerges as a financial risk diversification strategy. Consequently, projects with external sales paid in convertible currency enjoy an advantage over those serving domestic markets. LNG exports to China allow developers to leverage favorable exchange rates to increase ruble revenues and enhance overall investment performance.

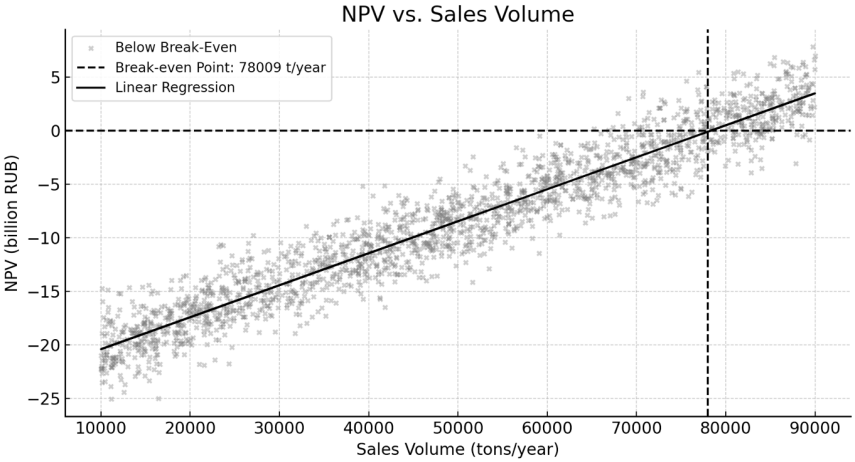


Figure 3. *NPV vs. Sales Volume with Break-Even Point and Regression Line*

Sales price is a significant, though not sole, profitability driver. While high-price scenarios (13–14 $/MMBtu) are the most profitable, elevated prices alone do not ensure positive results without corresponding sales volumes and favorable exchange rates. Thus, pricing must be analyzed in conjunction with other variables, particularly logistical feasibility and capacity utilization stability. The logistic infrastructure showed comparatively lower sensitivity, explained by its relatively modest contribution to overall cost structure.

China currently offers some of the most attractive LNG prices in the Asia-Pacific region. Unlike Russia's regulated domestic market with suppressed gas prices, exports to China generate revenue at market-based rates—formed through both long-term contracts and the spot market. The average long-term contract price for LNG deliveries to China ranged from $9 to $13/MMBtu, with spot prices in the

winter reaching $20–25/MMBtu. These figures substantially exceed the model's lower price boundary ($7/MMBtu) and approach the upper limits associated with positive project outcomes.

High export prices enable:

- Partial compensation for substantial capital and logistical expenses,
- Increased share of profitable scenarios in the investment model,
- Positive NPV outcomes even under limited delivery volumes.

Thus, access to the Chinese market offers the potential for LNG realization at prices significantly above domestic benchmarks—an essential factor for the financial viability of northern projects. The navigation period, fixed at 10–12 months in this model, remains one of the most critical prerequisites for the successful implementation of the project. As shown in other models, a half-year navigation window virtually eliminates the possibility of achieving a positive NPV. At the same time, year-round logistics in northern conditions require the creation of winter roads, integration of a rail component, or additional capital investments. Thus, logistical design decisions directly determine the project's financial outcomes

Let us analyze the impact of various factors on the final result. A regression analysis with feature normalization shows that the greatest influence is exerted by the sales volume: scaling up significantly enhances project profitability. The sales price and exchange rate also have a strong positive effect on returns. The navigation period exerts a moderate impact—more months of navigation yield higher revenues. Production costs and logistics have a negative effect, although their influence is considerably weaker than that of revenue-generating factors.

While export from mini-LNG plants itself is feasible[6], we need to make fine observations to adjust it to export from Yakutia. Thus, it is strategically important for the project to:

- expand the scale and share of year-round deliveries,
- secure high sales prices (via long-term contracts),
- and to receive revenue in foreign currency, preferably Yuan, whenever possible.

Based on the analysis, the LNG project in Yakutia—with parameters aligned to global market conditions—can be considered high-risk but potentially profitable. On the one hand, high capital intensity, the need for year-round shipping, and strong dependence on global prices and exchange rate fluctuations place the project in the zone of moderate investment risk. On the other hand, with well-calibrated parameters and the achievement of certain thresholds for volume, price, and currency rate, the project is capable of generating sustainable profits. The existence of even 17% profitable scenarios in the full sample confirms the presence of an investment niche—especially when supported by the state, subsidies, or strategic partnerships.

The obtained results may serve as a basis for developing alternative strategies. For instance, reducing CAPEX through modular solutions, increasing volumes through cooperation with consumers, and signing long-term, pre-paid contracts in foreign currency are all measures that could move the project into a zone of stable profitability. Another option is adapting the model for the domestic market, with export-level prices subsidized for end-users—particularly relevant for remote Arctic territories. In any case, the key success factors remain: controllability of sales volume, exchange rate management, and minimization of variable costs combined with the longest possible navigation period.

Modeling with industry-specific parameters confirms that the Yakutia-based LNG project has a limited but realistic probability of achieving investment efficiency. Based on the findings, a transition from the traditional "capital construction" model to a more flexible approach—emphasizing modularity, partnerships, and proactive risk management—is recommended. This would make it possible to transform even a moderately risky project into a source of long-term regional benefit and energy security. Furthermore, implementation should focus on creating a network effect by integrating several production facilities into a unified LNG plant network.

One of the strategically important aspects of orienting toward the Chinese market is the potential to establish long-term partnerships with major Chinese energy corporations. Companies such as CNPC, Sinopec, and CNOOC possess not only financial resources but also extensive experience in international LNG production and transportation projects. Chinese investors already hold equity stakes in Russia's largest LNG projects—for example, CNPC and the Silk Road Fund participate in Yamal LNG and Arctic LNG 2—demonstrating their interest in expanding cooperation.

For a small- or mid-scale LNG project in Yakutia, Chinese partners could act as:

- financial investors, reducing the project's debt burden;
- technological partners, supplying equipment and engineering solutions;
- guaranteed offtakers through long-term LNG purchase agreements.

Such collaboration mitigates both market and political risks. The possibility of advance financing (e.g., via prepayment structures) strengthens the project's financial resilience during the construction phase. Additionally, Chinese companies are interested in diversifying their import portfolio and securing stable supply routes, making a Russian-based project—particularly one utilizing the Northern Sea Route—attractive from the perspective of China's energy security. Moreover, cooperation with Chinese partners could provide access to Asian financial institutions and export credit agencies, substantially expanding the range of available financing instruments. In the long term, partial localization of production equipment

in China is also possible, which would reduce the project's capital expenditures. Thus, strategic partnership with Chinese corporations may become a key success factor—through investment inflow, contractual stability, and technological access.

References

1. Russia increased LNG exports to China by 3.3% in 2024 [Electronic resource]. – URL: https://neftegaz.ru/news/Trading/876120-rossiya-v-2024-g-narastila-postavki-spg-v-knr-na-3-3/ (accessed: 29.05.2025).

2. Rachevsky B. S. Methods for rapid assessment of the technical and economic indicators of LNG plants and production-consumption projects // Alternative Fuel Transport. – 2016. – No. 6 (54).

3. Rod S. How Profitable is the LNG Industry? A Full Breakdown of the Value Chain [Electronic resource] // LinkedIn. – URL: https://www.linkedin.com/pulse/how-profitable-lng-industry-full-breakdown-value-chain-rod-s--bgq0e (accessed: 01.06.2025).

4. Spot LNG prices in Asia slightly increased amid U.S.–China tariff truce [Electronic resource]. – URL: https://nangs.org/news/markets/gas/spotovye-tseny-na-spg-v-azii-chut-podrosli-na-tarifnom-peremirii-ssha-i-kitaya(accessed: 30.05.2025).

5. LNG transshipment capacity in the port of Sabetta may be expanded [Electronic resource] // PortNews. – URL: https://portnews.ru/news/291812/ (accessed: 01.06.2025).

6. Rachevsky B. S., Cheremnykh O. Ya. Feasibility of exporting liquefied natural gas from small-scale LNG plants // Gas Industry. – 2017. – No. 6 (753).

DOI 10.34660/INF.2025.16.71.144

波罗的海海峡航行法律监管问题
PROBLEMS OF LEGAL REGULATION OF NAVIGATION IN THE BALTIC STRAITS

Litvin Tatyana Alexandrovna
Associate Professor
Grigoryan Anna Gareginovna
Lecturer
Yaroslavtsev Kirill Ruslanovich
Student
Admiral F. F. Ushakov State Maritime University

摘要：本文探讨了波罗的海海峡制度的法律问题，其中最主要的是保障航行自由。本文分析了1982年《联合国海洋法公约》第三部分的规定、《哥本哈根条约》以及海峡沿岸国的立法规范。并从保障俄罗斯联邦利益的角度提出了解决方案。

关键词：波罗的海海峡、《哥本哈根条约》、《过境通行》、《国际海事法》、《航行自由》。

Abstract. *The legal problems of the Baltic Straits regime are considered, the main one being ensuring freedom of navigation. The analysis of the provisions of Part III of the UN Convention on the Law of the Sea of 1982, the Copenhagen Treaty, as well as the norms of the legislation of the strait states is carried out. Solutions are proposed from the point of view of ensuring the interests of the Russian Federation.*

Keywords: *Baltic Straits, Copenhagen Treaty, transit passage, international maritime law, freedom of navigation.*

The Danish Straits (Baltic Straits) are a system of straits between the Scandinavian and Jutland peninsulas. Connects the Baltic and North Seas. Includes the straits of the Little Belt (length 130 km, width from 0.5 to 41 km, least depth in the fairway 11.9 m), Great Belt (120 km, from 11 to 78 km, 11.3 m), Øresund (Sund) (102 km, from 3.4 to 49 km, 8 m), Kattegat (270 km, from 60 to 160 km, 17 m) and Skagerrak (225 km, from 60 to 155 km, 53 m). [1] The Danish straits are the main sea route connecting the ports of the Baltic Sea with the ports of the World Ocean. The straits are quite treacherous: the passage of ships is complicated by narrow places, sharp turns, strong currents and shallow depths, so supertankers cannot

enter the Baltic. The Great Belt Strait is more suitable for shipping, but even there only a few fairways are suitable for the passage of large-tonnage vessels.

Shipping in the straits ensures Russian oil exports through the ports of the eastern part of the Gulf of Finland and determines the maximum size of tankers that can be used. In the most cramped places, natural depths do not exceed 17 meters, which allows tankers to be loaded to a draft of no more than 15.5 meters at the exit from Primorsk. The marine area of the Baltic Sea is given great importance in the context of the development of the East-West transport corridor. For several years now, under the pretext of environmental protection, there have been discussions at the level of the European Union about tightening the shipping regime for the Russian Federation in the Baltic. However, any such actions are strictly regulated by international maritime law. The formation of the legal regime for navigation in the Baltic Straits is influenced by the norms of international maritime law, the legislation of the strait states (Denmark and Sweden), IMO recommendations, the so-called Copenhagen Treaty of 1857, and the treaty concluded between Denmark and the United States. The Copenhagen Treaty of 1857 did not regulate all issues of navigation in the strait; the conference participants set a narrower task - to abolish duties on merchant ships, which the Danish crown had been collecting for passage through the straits since the mid-16th century and which were called "Sund duties". For their part, other states assumed the payment of compensation to Denmark over 20 years in the amount of 30,476,325 riksdalers. Almost a third of this amount was paid by Russia. [2]

In the preamble to the Treaty of 1857, the parties indicated that "driven by the same desire to facilitate and expand trade and maritime relations currently existing between their states or carried out through them, both by the complete and permanent abolition of all duties levied on foreign ships and their cargo when passing through the Sound and Belts, and by exempting goods from duties in transit along the routes that connect the German Sea and the Elbe with the Baltic Sea...".[3]

According to Article 1 of the Treaty of 1857, Denmark undertook "not to collect any customs, last, lighthouse, buoy or any other fees from the hull or cargo of ships which, on their way from the German Sea to the Baltic or vice versa, will sail through the Belts or the Sound, regardless of whether they will only pass through Danish waters or will be forced by any circumstances related to navigation or trade operations to drop anchor or remain there for a time... No ship may henceforth, under any pretext whatsoever, be detained or stopped in any way while passing through the Sound or the Belts." In addition, Denmark was obliged to preserve and maintain in good condition all lights and beacons located at the entrance to ports, harbors, roadsteads and rivers or canals, as well as buoys, landmarks and signs ensuring navigation in the straits, to replace them in a timely manner and, if the navigation situation so requires (Article 2). A special legal regime of navigation was established in the Baltic Straits, in which Denmark has limited sovereignty.

From warships, which were not mentioned in the Treaty, fees were also not collected. The first rules regulating the navigation regime in the Baltic Straits were adopted by Denmark in 1912, and in 1938 Denmark issued new rules of neutrality. A requirement was introduced for the passage of submarines only on the surface and with a raised flag. In 1951, after Denmark joined NATO, national regulations on access to Danish areas by foreign military ships and aircraft in peacetime were introduced for the first time. [2] The next restrictions, which affected military vessels and vessels not used for commercial purposes, were introduced by Denmark in 1976.

Since the seventies of the last century, the IMO has adopted a number of resolutions with the general title "Navigation in the entrances to the Baltic Sea". The latest such recommendation is MSC Resolution 138(76) "Recommendations for navigation in the entrances to the Baltic Sea". At the same time, the recommendation to use the services of pilots was expanded and extended to vessels with a draft of 11 meters. In addition, in 2007, at the 86th session of the Maritime Safety Committee (MSC), amendments were adopted to these recommendations related to the fact that Denmark declared a decrease in the depths in the straits due to the migration of sand banks. Also, vessels of any size carrying irradiated nuclear fuel, plutonium and high-level radioactive waste (SNF cargo) are strongly recommended to use the services of local pilotage services for passage, and ship captains should take into account all the capabilities of the new and improved navigation equipment introduced by Chapter V of the SOLAS Convention (Safety of Navigation), including the Electronic Chart Display and Information System (ECDIS).[4]

Today, as 150 years ago, only one state practically determines the procedure for the passage of ships and the flight of aircraft through the sea area, which is the only exit from the closed Baltic Sea to the Atlantic Ocean. [5]

One of the problems associated with the legal regime of the strait zone is the change by the strait states to the width of the territorial sea to 12 nautical miles. The increase in the spatial limits of the territorial sea by these states affects the regime of the waters that form the strait zones. Recently, the phrase has been heard more and more often: the accession of Finland and Sweden to the North Atlantic Alliance has turned the Baltic into an internal sea of NATO. There is some truth in this, from the point of view of oceanography, the Baltic Sea (like the Black and Mediterranean) has long been classified as "internal", but solely due to such factors as the connection with the World Ocean through a narrow passage (the Baltic Straits) and a special hydrological regime (low salinity).

From a geographical point of view, only seas surrounded by the shores of one state are considered "internal". From a legal point of view, such seas are internal waters of the country that surrounds them, and, therefore, are under its full sovereignty, extending not only to the water area, but also to the airspace above it, as

well as to the seabed and subsoil. The Baltic Sea consists entirely of water areas that are subject to either sovereignty (internal waters, territorial sea) or sovereign rights and jurisdiction (24-mile contiguous and 200-mile exclusive economic zones) of coastal countries. This means that most of the Baltic waters are exclusive economic zones of coastal states; there is not a single section of open sea. As for Russia, it has all the maritime zones prescribed by the 1982 UN Convention on the Law of the Sea in the Baltic Sea, both in the Gulf of Finland and in the Greater Baltic, where the Kaliningrad Region is located. Such rights to maritime areas are conditioned by the principle of Land dominates the Sea, according to which you can establish one or another legal regime with respect to water areas if you have sovereignty over the corresponding coastal territory. Since no one is trying to challenge the state affiliation of our territories in the Baltic, it is impossible to classify the Baltic as an internal sea of NATO. At the NATO summit, Secretary General Mark Rutte will announce that NATO is launching the Baltic Sentry project – an operation to patrol the Baltic Sea to protect the underwater infrastructure of its countries, which will involve frigates and naval aviation. [6] The pretext for restricting the passage of tankers with Russian oil may be claims regarding their unsafety or the lack of European insurance. The fact is that Europeans are concerned about the reliability and ability of insurers that are not members of the International Group of P@I Clubs (IGP&I) to cope with oil spills or other accidents. In addition, the likelihood of such incidents increases due to the increase in the average age of the vessels used to transport Russian oil under Western restrictions. The maritime authorities of European countries will now request proof of insurance from those vessels that pass through the Danish Straits, the Gulf of Finland and the waters between Sweden and Denmark. Insurance must be obtained in one of six coastal states: Great Britain, Denmark, Sweden, Poland, Finland and Estonia. Sanctions may also be imposed on tankers that refuse to respond to requests from the authorities. Earlier G7 demands prohibit Western insurers from providing insurance to ships that violate the $60 per barrel price cap on Russian oil. Western politicians formally cite their concerns about possible financial and environmental damage to European countries in the event of an accident involving a tanker without adequate insurance. [7] As a result, Russia is facing attempts to restrict cargo transportation carried out in its interests in the western direction. In October 2022, the Financial Times wrote about the concerns of the Danish authorities that tankers carrying Russian oil going through the Danish straits could crash or spill their cargo if they pass through dangerous shallow waters without local pilots. However, in connection with relevant requests from the Nordic countries, the EU nevertheless decided in March 2023 to provide exceptions for pilotage services from sanctions against Russia. [8]

The Baltic Straits are one of the world's "bottlenecks" as a route for transporting energy resources, and in order to ensure the safety of navigation, and some-

times guided by political factors, they can be closed by Denmark. Closing the straits will lead to the activation of projects to develop alternative trade routes. Transport alternatives to the Baltic Straits are:) Construction of a new railway route "North-South" will help Russia finally "get out" of trade dependence on Europe. This 7,200-kilometer route will be inaccessible to Western sanctions, since it will connect the Russian railway network with Azerbaijan, and then with Iran. Further, from the Iranian seaports on the Persian Gulf coast, Russian goods will be sent to India, Saudi Arabia, the UAE, Pakistan and other countries of the Global South.

2) Development of the Northern Sea Route (NSR) and the Murmansk port project with the transfer of transport flows from the Baltic direction to it. In May 2023, Rosatom CEO Alexey Likhachev proposed at a meeting with Vladimir Putin to redirect Russian oil exports from the Baltic ports to the NSR. According to Rosatom, this is "the most attractive and safest route" in the context of sanctions. [9] To expand this plan, it is necessary to expand the fleet of tankers and icebreakers and build an oil pipeline to the port of Murmansk. Due to their strategically important geographical location, the Baltic Straits play a key role in ensuring regional trade and security, especially for the Baltic Sea countries and Russia. The Baltic Straits are not subject to the legal regulation of the 1982 UN Convention on the Law of the Sea. Article 35 of the Convention stipulates that "nothing in this Part shall affect … the legal regime of straits, passage through which is regulated in whole or in part by long-existing international conventions in force relating specifically to such straits." [10] The legal regime of the Baltic Straits is regulated by the Copenhagen Treaty of 1857 and the legislation of the coastal states. At present, the Copenhagen Treaty of 1957 does not regulate the passage of ships of different legal status through the Baltic Straits, since it does not provide for guarantees of freedom of navigation.

References

1. Danish Straits. The Great Russian Encyclopedia https://old.bigenc.ru/geography/text/1941620

2. Lopatin M.L. International Straits and Canals: Legal Issues. - M.: International Relations, 1985. – p.109.

3. Treaty of Copenhagen on the abolition of duties levied on ships and cargo during their passage through the Sound and both Belts // https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=INT&n=15678

4. RESOLUTION MSC.138(76) (adopted on 5 December 2002) RECOMMENDATION ON NAVIGATION THROUGH THE ENTRANCES TO THE BALTIC SEA // https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MSCResolutions/MSC.138(76).pdf

5. A.A. Salimgerey. Some theoretical and legal problems of the legal regime of the Baltic Straits, p. 147-153 // https://www.sovremennoepravo.ru/m/articles/view/

6. Baltic Watch // https://ru.ruwiki.ru/wiki/Baltic_watch

7. Western insurers and traders see risks of incidents https://neftegaz.ru/news/ecology/775402-zapadnye-strakhovshchiki-i-treydery-vidyat-riski-intsidentov-s-razlivami-nefti-v-more-iz-za-sanktsiy/

8. Denmark, according to new EU plans, will check and probably block tankers with Russian oil passing through its waters https://dzen.ru/a/ZVeK7mXi_AVweKbU

9. This is the Northern Sea Route - Kommersant. 05/17/2023 URL: https://www.kommersant.ru/doc/5987833To implement this plan, it is necessary to expand the Russian fleet of tankers and icebreakers and build.

10. The United Nations Convention on the Law of the Sea of 1982 //http://pravo.gov.ru/proxy/ips/?docbody=&link_id=1&nd=203004608&collection=1&ysclid=mbam9ikfhp801564093

DOI 10.34660/INF.2025.81.42.145

关于外国人在白俄罗斯共和国境内居留的法律制度问题
ON THE ISSUE OF THE LEGAL REGIME OF FOREIGNERS' STAY IN THE TERRITORY OF THE REPUBLIC OF BELARUS

Mikhnavets Yuliya Ivanovna
Inspector
Soligorsk District Executive Committee;
Police Captain, Adjunct
Academy of the Ministry of Internal Affairs of the Republic of Belarus

摘要：移民政策是公共行政的重要领域，其有效性对整个国家的国内外政策有着重大影响。本文分析了“法律制度”概念的内涵，并结合国家法律框架的规定以及相关领域学者的观点，提出了明确“白俄罗斯共和国外国公民和无国籍人居留法律制度”定义的建议。本文系统梳理了外国人居留法律制度作为一种行政法律制度的普遍特征，并指出了其独特之处。

关键词：公民、外国公民、无国籍人、行政法律制度、法律制度、外国人、公民身份。

Abstract. *Migration policy is an important area of public administration, its effectiveness has a significant impact on the domestic and foreign policy of the country as a whole. This article analyzes the content of the concept of "legal regime", formulates proposals to clarify the definition of "legal regime of stay of foreign citizens and stateless persons in the Republic of Belarus" taking into account the provisions of the national regulatory framework and the views of scientists who have studied this issue. Universal features of the legal regime of stay of foreigners as a type of administrative and legal regime are systematized, features, its unique features are identified.*

Keywords: *citizen, foreign citizen, stateless person, administrative and legal regime, legal regime, foreigner, citizenship.*

Implementation of effective integrated border management and balanced migration policy today are among the most important tasks due to the ongoing military actions on the territory of our neighbors. This requires, first of all, a revision of approaches to ensuring the security of the State Border and the migration regime.

According to the Constitution of the Republic of Belarus, a person, his rights, freedoms and guarantees of their implementation are the highest value and goal

of society and the state. Accordingly, the state undertakes to protect the rights and freedoms of a person and citizen, and each citizen of our state is endowed with all due rights and must fulfill the duties imposed on him.

Article 11 of the Basic Law of the country determines that foreign citizens and stateless persons (hereinafter, unless otherwise specified, foreigners) on the territory of the Republic of Belarus enjoy rights and freedoms and fulfill duties equally with citizens of the Republic of Belarus, unless otherwise specified by the Constitution, laws and international treaties. These provisions serve as the basic foundations for the formation of the legal regime of stay of foreigners on the territory of our country.

The legal regime of stay of foreign citizens was studied in their works by scientists N.V. Valyushko-Orsa, Yu.E. Krivosheenko, S.S. Kupreev, V.G. Tikhinya, A.I. Fedorako, A.S. Shaburov, Zh.S. Zhaykbaev and others.

The purpose of this study is to analyze the category of "legal regime", as well as related concepts to determine the definition of "legal regime of stay of foreign citizens and stateless persons" on the basis of previously conducted scientific research and provisions of domestic legislation.

In social sciences, scientists do not have a clear definition of the concept of "regime", in various sources this concept has the following meanings: a strictly established order in any sphere of life; form of government; state system, working conditions or a system of rules that must be followed to achieve a particular goal.

Despite the fact that in scientific works of both domestic and foreign scientists the category of "legal regime" was considered, a holistic view has not yet been received for the following reasons [1]:

there is no consensus in the literature regarding the essence of legal regimes;

this category has recently become widely used in the branches of administrative law;

the term "legal regime" is used by legislators in various normative legal acts.

As a rule, in science, the legal regime is considered as a special form of legal regulation, covering a system of legal means that are used depending on the established legal goals and social factors or forms of functioning of legal relations [2, p. 67].

In turn, A.A. Shakhmametyev speaks of the legal regime as a procedure for regulating a type of activity, an area of public relations, the status of an object through a set of legal and organizational instruments and measures enshrined in the form of a system of legal norms [3, p. 65].

V.B. Rushailo understands the legal regime legislatively as a certain system that influences public relations through the use of specific legal forms, means and methods [4, p. 7].

G.S. Belyaeva also names "mandatory normative-legal consolidation" as one of the features of the legal regime [5, p. 291].

S.S. Alekseev, analyzing legal regimes within the framework of the general theory of law, notes that the legal regime is a "special, integral system of regulatory impact" operating on the basis of uniform principles and rules, the specificity of which is determined by the order of emergence, formation and implementation of rights, obligations, restrictions or benefits, and methods of implementing sanctions [6, p. 209, 243].

Developing this thesis, V.B. Rushailo states that the question of the content of this legal phenomenon "is decided in connection with the specific characteristics of the subject and method of legal regulation of social relations of a particular branch of law" [4, p. 8].

T.Sh. Kulmatov and A.O. Slastunina in international law understand the concept of "legal regime" as the established procedure for the movement of foreign citizens of various states [7, p. 115]. I. I. Makh understands the legal regime as a spatial and functional state of any social object, regulated by legal norms, of a law enforcement nature and expressed in various restrictions [8].

S. S. Mailyan understands the term legal regime as a special form of organizing systems and processes of public administration, through law securing its most important components. He believes that the legal regime is the establishment of a special order of activity in a particular sphere of life, and this order can be both ordinary and extraordinary [9, pp. 10, 15].

According to V. F. Ermolovich, administrative and legal regimes are a set of legal, organizational, and other measures that ensure in specific areas of social relations a certain order of activity of state bodies and public organizations, their officials, as well as the behavior of individual citizens, which best meets the interests of ensuring national and public security [10, pp. 4, 5]. It is also worth noting the work of Belarusian researchers "Administrative and Legal Regimes of the Republic of Belarus" (under the general editorship of V.F. Ermolovich), which examines various points of view of scientists on the problem of the content and forms of legal regimes, analyzes the purpose, features, attributes and structure of administrative and legal regimes, proposes their classification, and provides characteristics of various types of regimes [11].

Thus, in constitutional law, the term "regime" is used in the study of the political system of society (political regime), in characterizing the actually implemented model of relationships between the highest bodies of the state, primarily between the legislative and executive branches of power (state regime) [12, p. 135, 209], as well as in determining the legal status of foreigners [13, p. 27]

Representatives of criminal-executive law consider the "regime": as a system of measures to achieve the goals facing the industry and as the procedure for serving sentences by convicts [14, p. 150], in a broad sense - as a system of measures that are used to achieve the goals of the correctional labor institution, in a narrow sense - as a set of rules of conduct for the convicted person [15, p. 94-95].

In the theory of international law, the term “legal regime” is used to characterize the legal status of subjects of international law, and to classify various objects [10, p. 388; 19, p. 599].

The term “legal regime” is also used in land law and is expressed in a set of legal norms that regulate public land relations. The purpose of such regulation is the rational use and protection of land, as well as strengthening the rule of law in the field of land relations [16].

According to B.V. Erofeev, the concept of the legal regime of lands should be understood as the legal procedure for the use of lands, as well as the provisions of lands enshrined in law, established for certain categories of lands [17, p. 370, p. 374].

I.O. Krasnova understands the legal regime of lands as a set of legal requirements that determine the procedure for land use and land protection [189, p. 190].

When analyzing the legal regime of the territories exposed to radioactive contamination as a result of the Chernobyl disaster, it should be understood that this legal regime is a system of rules regulating not only certain prohibitions and restrictions associated with the territories exposed to radioactive contamination as a result of the Chernobyl disaster, regulating the implementation of certain measures to overcome the consequences of this disaster in order to reduce the radiation impact on the population and the environment.

Analyzing the legal regime in customs law, we can say that this is a set of provisions, rules and obligations that determine the status of goods of transport vehicles transported across the customs border of our country, as well as the norms and principles governing the relations of the EAEU member states in the field of customs law [19].

The study and analysis of scientific sources on the problem under consideration allow us to note that the administrative and legal regime is an objectively existing legal phenomenon that combines a set of organizational and legal means with the content of regulated social relations. This means that if a subject enters into relations regulated by a particular legal regime, then the entire complex of norms and means of a regulatory, protective, procedural and procedural nature aimed at realizing his rights, fulfilling his duties, and in case of violations of the established rules of conduct - the application of coercive measures are immediately put into effect.

It should be noted that all administrative and legal regimes without exception are based primarily on the Constitution and are established exclusively through the publication of legislative acts of our country.

Thus, each sphere of society’s activity is organized in a certain type (kind) of legal regime, differentiated by its functional purpose, which is the main distinguishing feature of legal regimes from each other.

We consider it reasonable to understand the legal regime as a special procedure for regulating a certain sphere of social relations using methods of permission, obligations and prohibitions, regulating the rights and obligations of their participants, the totality and content of which is determined by the specifics of the regulated social relations, implemented in accordance with the rules of law. The main regulator of relations between our state and a foreigner is the Law of the Republic of Belarus of January 4, 2010

No. 105-Z "On the legal status of foreign citizens and stateless persons in the Republic of Belarus", which regulates both the legal status of foreigners and the regimes of their stay in our country. At the same time, the law regulates in detail the regimes of stay of foreigners, but does not define the regime of stay itself.

The legal regime of stay of foreigners is similar in general features to other legal regimes in various spheres of life, but has its own characteristics and is aimed at regulating social relations arising between foreigners and the Republic of Belarus as the state of their stay, has its own subject, its own subjects and objects, a characteristic complex of their interrelations and relationships. Taking into account the data of previously conducted scientific research and the provisions of domestic legislation, we propose to understand the legal regime of stay of foreigners in the Republic of Belarus as a special procedure for legal regulation of public relations between foreigners and the state, based on legal means established and provided by the state, aimed at ensuring the implementation of their rights by foreigners, taking into account the interests of the state, expressed in a set of law enforcement, control, supervisory and coercive measures aimed at ensuring the legality of stay of foreigners in the territory of the Republic of Belarus.

Thus, in order to form the author's definition, it is necessary to conduct a comparative legal analysis. There are two approaches in international practice:

Universalist approach (for example, in the EU): assumes the existence of standards for the treatment of foreigners regardless of citizenship (rights to medical care, education, prohibition of discrimination, etc.).

Sovereign approach (for example, in the CIS countries, including Belarus): is based on granting foreigners only those rights that are directly enshrined in law or international agreements.

A comparison allows us to highlight the distinctive features of the Belarusian model of the legal regime for the stay of foreigners:

Formalization and legal detail — regulation through special acts (the Law on the Legal Status of Foreign Citizens and Stateless Persons, the Regulation on Visas, etc.).

Priority of national interests — compliance with the principle of security and law and order.

Hierarchy of rights — foreigners enjoy rights equally with citizens only in the absence of special restrictions.

Instrumental use of the regime — for migration management, protection of the labor market, demography, etc.

A special legal regime for the stay of foreign citizens and stateless persons in the Republic of Belarus is a procedure for regulating the legal status of foreigners established by regulatory legal acts, including a set of rights, obligations, restrictions and guarantees, implemented in order to ensure state sovereignty, public safety and compliance with international obligations.

Thus, it should be assumed that the study of the phenomenon of the regime of stay of foreigners in our country today is a very important problem, which is determined, first of all, by constitutional principles, according to which a person, his rights and freedoms are the most important value.

References

1. Modern Theory of Legal Regimes: Theoretical and Sectoral Approaches [Text]: monograph / [V. P. Belyaev, G. S. Belyaeva, K. V. Dyadyun; ed. V. Yu. Panchenko, A. A. Petrov]. - Krasnoyarsk: SFU, 2017. – 296.

2. Domchenko A. S. Administrative-legal regime and normativity of an administrative-legal act: from investigation to foundation / Russian justice. – 2020. – No. 6. P. 66-68.

3. Shakhmametyev, A. A. Category "regime" in the legal mechanism of taxation / A. A. Shakhmametyev // Law. Journal of the Higher School of Economics. – 2009. - No. 1. - P. 63-78.

4. Rushailo V.B. Administrative and legal regimes. – M.: Shield-M, 2000. – 264 p.

5. Belyaeva G.S. Legal regime: concept and signs / G.S. Belyaeva // Bulletin of RUDN University. Series: Legal sciences. – 2021. – No. 1. – pp. 281-293.

6. Alekseev S.S. Theory of law. – 2nd ed., revised. and additional – M.: Beck, 1995. – 311 p.

7. Kulmatov, T.Sh. Legal regime for the movement of citizens of the CIS member states / T.Sh. Kulmatov, O.A. Slastunina // Journal of Russian Law. 2003. No. 10.

8. Mach I.I. Powers of administrative and supervisory bodies in the sphere of establishing a special legal regime / I.I. Makh // Vesti in-ta sovrem. Znanii, 2003.№2(16).

9. Mailyan, S.S. Administrative and legal regimes in the theory of administrative law and practice of public administration of law enforcement activities: monograph. / S.S.Mailyan. – M.: UNITY-DANA, Law and Right, 2002. – 214 p.

10. Administrative and legal regimes in ensuring border security of the Republic of Belarus / V.F. Ermolovich [et al.]; under the general editorship of A.A. Pavlovsky. – Minsk: Tesey, 2004. – 296 p.

11. Administrative and legal regimes of the Republic of Belarus / V.F. Ermolovich [et al.]; under the general editorship of V.F. Ermolovich. - Minsk: Acad. MVD, 2013. - 291 p.

12. Administrative process: textbook for bachelor's and master's degrees / N.G. Salishcheva [et al.]; under the general editorship of M.A. Shtatina. - M .: Yurait Publishing House, 2015. - 364 p.

13. Alekseev, S.S. General theory of law: in 2 volumes / S.S. Alekseev. – M .: Legal literature, 1981. – 1 volume – 360 p.

14. Theoretical foundations of criminal-executive law / V.B. Shabanov [et al.]; under the editorship of V.B. Shabanov. – Mn .: Tesey, 2002. – 288 p.

15. Natashev, A.E. Fundamentals of the Theory of Correctional Labor Law / A.E. Natashev, N.A. Struchkov. – M.: Legal Literature, 1967. – 190 p.

16. Klebanovich, N. V. Fundamentals of Land Legislation and Law: a manual for students of the direction 1-31 02 01-03 "Geography (geoinformation systems)" / N. V. Klebanovich, N.V. Kovalchik. – Minsk, BSU, 2008 – 200 p.

17. Erofeev, B.V. Land Law: a textbook for universities / B.V. Erofeev, G.V. Chubukov; ed. G.V. Chubukov. – M.: Novyi Yurist, 1998. – 544 p.

18. Krasnova, I.O. Land Law. Elementary Course / I.O. Krasnova. – 2nd ed., revised and enlarged. – M .: Jurist, 2003. – 270 p.

19. On customs regulation in the Republic of Belarus [Electronic resource]: Law of the Rep. Belarus, January 10, 2014, No. 129-Z: as amended by the Law of the Rep. Belarus of April 22, 2024 No. 366-Z // ilex / OOO YurSpektr. – Minsk, 2024.

DOI 10.34660/INF.2025.91.34.146

人工智能作为全球领导力变革因素：中国战略对世界秩序的影响
ARTIFICIAL INTELLIGENCE AS A GLOBAL LEADERSHIP TRANSFORMATION FACTOR: THE IMPACT OF CHINA'S STRATEGY ON WORLD ORDER

Mirashnichenka Leanid Aliaksandravich
Graduate Student
Qingdao University, School of Politics and Public Administration

摘要. 随着人工智能技术的快速发展，其在国际关系中的应用越来越广泛，涉及多个领域。中国政府为规范人工智能在国家层面上的应用所出台的关键文件，确定了中国在人工智能领域的战略优先事项。人工智能技术已成为中国增强其国际影响力的工具之一。作为中国增强影响力的例子，本文提到中国的“数字丝绸之路”倡议，以及2025年1月中国公司发布的新型人工智能模型。这一事件引发了国际社会的强烈反应，突显人工智能作为战略影响力工具的重要性，人工智能能够在全球竞争中设定新的标准。显然，成功推广人工智能需要一个全面的方案，包括制定国际标准和协议，以确保人工智能的道德和安全应用。

关键词：人工智能；全球领导力；全球治理

Abstract. *With the rapid development of artificial intelligence technology, its applications in international relations have become increasingly widespread, spanning multiple domains. The Chinese government has issued key policy documents to regulate the national-level deployment of artificial intelligence, outlining China's strategic priorities in this field. Artificial intelligence technology has emerged as one of China's tools to enhance its international influence. As an illustrative example, this paper highlights China's "Digital Silk Road" initiative and the January 2025 release of an artificial intelligence model by a Chinese company. This event triggered significant international reactions, underscoring artificial intelligence's role as a strategic instrument of influence. Artificial intelligence became a new benchmark in global competition. Crucially, the successful global promotion of artificial intelligence requires a comprehensive framework, including the establishment of international standards and protocols to ensure its ethical and secure application.*

Keywords: *artificial intelligence; global leadership; global governance*

引言

人工智能作为21世纪的关键技术之一，对国际体系的变革产生了深远影响。一方面，人工智能推动了医疗、教育、经济、外交及国际安全等多个领域的效率和质量提升。另一方面，人工智能的先进算法可能被用于研发致命武器，被恐怖组织利用，或成为未经授权的数据收集与处理工具，从而对全球安全构成新的挑战。因此，国际社会面临着紧迫任务，即制定人工智能监管机制，明确其应用边界，并建立相应的伦理规范，以最大程度地降低风险，防止其对国际稳定造成潜在威胁。

一、中国的人工智能政策

对于中国而言，人工智能是具有战略意义的领域，不仅对国内经济增长有帮助，中国在国际舞台上的地位也将得到提升。人工智能的发展和政府计划的实施，源于全球技术变革中保障国家安全、提高人民生活质量和保持经济持续增长的需要。正因如此，中国率先制定了相关法律和政策文件，以在国家层面规范人工智能的使用。

（一）《新一代人工智能发展规划的通知》

中国政府目前在人工智能领域的主要战略文件是国务院2017年发布的《新一代人工智能发展规划的通知》。 文件强调，人工智能已成为国际竞争的新焦点，领先的发达国家正积极制定各自的战略，力求在新一轮技术竞赛中占据领先地位。文件同时指出，人工智能是新一轮工业革命的关键驱动力，它将重构所有经济活动的环节，催生新的技术、产品和行业，成为推动经济发展的新引擎。根据文件，中国政府的主要目标是加速将人工智能应用到经济、社会和国防中，重点提升新一代技术的创新潜力，发展智能经济，并保障国家安全。

人工智能行业将是一个新的经济增长点。根据统计数据，2021、2022、2023年中国人工智能主要产业增速分别为33.3%、18%、13.9%，2023年人工智能产业规模达到5784亿元。 2024年，人工智能核心产业规模接近6000亿元。 人工智能产业的发展不仅体现在人工智能本身，整个数字经济的发展也是产业发展的重要组成部分。从2012年到2023年，中国的数字经济规模从11.2万亿元增长到53.9万亿元，年均增长15.3%，并在2023年为国内生产总值（简称：GDP）增长贡献了66.5%的数字经济，成为拉动中国经济增长的重要力量。 2024年中国的数字经济规模预计超过60万亿元，占GDP的比重超过50%。 根据本文件，在2030年之前，人工智能的技用及应用将达到世界领先水平，中国主要产业规模将突破1万亿元，相应产业将超过10万亿元。

中国政府的主要任务也在《新一代人工智能发展规划的通知》中明确提出。首先是加强基础理论的研究，并在大数据智能分析及跨媒体技术等关键技术领域取得突破，积极开发人工智能技术。中国在经济中还需深入促进人工智能的融合特别是制造、农业、金融及物流业的发展。另外，为了规范人工智能需要建立法律、伦理和政策基础。通过建立跨部门协调，将政府结构加以优化来达到这些目的，培养和吸引人工智能领域的人才来实

现。通知特提出，要积极参与全球人工智能的开发与治理，加强与国际组织和各国的合作。总体而言，《新一代人工智能发展规划的通知》是利用人工智能发展的重要文件，为中国创造竞争优势，巩固其在技术领域的全球领导地位。

（二）《生成式人工智能服务管理暂行办法》

中国重视人工智能监管的一个标志是2023年7月发布的《生成式人工智能服务管理暂行办法》。 该文件由包括国家互联网信息办公室、国家发展改革委、工业和信息化部等七个部门联合发布。这是全球首个专门针对生成性人工智能（如ChatGPT）的监管文件。 该文件旨在规范生成性人工智能服务的开发、应用和管理，确保其安全性、可控性和发展。文件还提及了国际合作，强调促进生成性人工智能技术的发展，应鼓励与国际社会的合作。文件指出，应该支持中国企业参与全球人工智能研发，并遵守国家法律。

中国人工智能战略是一项旨在加强中国在全球科技领域领导地位的综合性长期计划。为了实现这一战略，中国必须指定国家层面的行动计划。因此，中国特别重视在人工智能领域的发展国家立法。《新一代人工智能发展规划的通知》、《生成式人工智能服务管理暂行办法》等主要文件体现了中国在人工智能领域的战略优先方向。《生成式人工智能服务管理暂行办法》由于是世界上第一个专门针对生成性人工智能的法律文件，因此不仅对中国的国家立法至关重要，而且对全球社区也意义非凡。这一规范不仅为中国发展生成性人工智能提供了法律保障，同时也将中国在全球人工智能治理方面的立场和做法展示给了国际社会。

二、人工智能作为增强中国全球领导力的工具

中国将人工智能视为国家战略的重要组成部分，旨在通过技术创新和应用推广提升其全球影响力。在这个场域内，中国外交的一个重要走向就是多边外交。通过与其他国家和国际组织的合作，中国致力于推动全球人工智能技术的规范和标准化，并为全球治理提供中国方案。中国的人工智能政策不仅侧重于国内发展，还注重在国际上塑造其技术领导力。

（一）中国在联合国内的活动

中国在国际舞台上，特别是在联合国的框架内，中国经常关于人工智能提出的监管建议。2023年10月，在第78届联合国大会上，习近平主席提出了全球人工智能治理倡议，全面阐述了中国的立场，涵盖发展、安全和管理三个方面。该倡议反映在同一届大会通过的《加强人工智能能力建设方面的国际合作》决议（决议号：A/78/L.86）中，该决议得到了140多个国家的全体通过。决议强调，人工智能的发展应遵循“以人为本”的原则，促进有益智能的发展，并造福人类。决议还鼓励国际合作和切实行动，帮助发展中国家提升人工智能潜力，扩大它们在全球人工智能治理中的代表性和声音。[1]

[1] 国务院.关于印发新一代人工智能发展规划的通知：国发〔2017〕35号[A]. 2017-07-20.

在2024年12月的联合国安全理事会关于人工智能的简报中，中国提出了一系列倡议，考虑到人工智能技术的快速发展和应用。 首先，中国为保证对人工智能的合理管理提出了明确的指导原则，这不仅可以对风险进行较好的预测和控制，而且可以鼓励技术革新，提倡人工智能的和平利用。其次，要建立风险评估体系，分类实施人工智能管理措施。最后，中国认为，在人工智能领域加强国际间合作是十分有必要的。中方反对几个国家单方面制订规则。中国也反对破坏各国特别是发展中国家平等获得新技术权利的基于意识形态差异的歧视性壁垒。

中国在联合国框架内积极推动其在全球人工智能监管方面的立场。中国主张多边主义，强调国际合作在人工智能领域的重要性，包括技术发展、安全和管理。中国的关键倡议旨在确保人工智能的和平利用，遵守国际人道法，并防止人工智能成为武装冲突的工具。在这一背景下，中国主张建立全球风险评估体系，并推动基于公平和非歧视性原则的人工智能管理机制。

（二）中国在其他国际平台上的活动

中国提出了有关建设人工智能潜力造福所有人的行动计划，并推动成立了人工智能潜力建设国际合作小组。习近平主席在2024年11月出席第十九届二十国集团领导人峰会期间强调加强人工智能领域的国际治理与合作。在金砖国家框架内，中国与其他成员国商定，为制定人工智能治理框架、规范和标准，创建旨在开展信息交流和技术合作的人工智能研究小组。

在人工智能在军事领域的应用方面，中国阐明了自己的立场。在2021年关于《关于非人道武器的公约》的审议会议上，中国政府提交了一份《中国关于规范人工智能军事应用的立场文件》。 该文件主要致力于促进国际社会对致命自主武器系统的治理。因此，中国对研制致完全自主的武器系统（即不需要人工干预，就可以选择目标、打击的武器），是坚决予以反对的；中国指出，完全自主的武器系统违反国际人道法和伦理原则，都可能导致不可控制的结果。强调要有人工智能的军事系统，要把设计和应用作为保证民众的安全。

在此文件中，中国要求根据《关于非人道武器的公约》制定具有法律约束力的国际规范，以规范人工智能应用于军事领域。从研发、测试、部署到应用，强调国际规范应涵盖人工智能技术的整个生命周期。文件中还指出中国支持将人工智能技术和平使用通过国际性合作和技术交流。为了确保人工智能在军事上的透明度与可控性，文件建议建立全球监督机制，文件也成为在军事人工智能应用方面填补国际法空白的倡议。

（三）“一带一路”框架下人工智能领域合作

除了多边外交外，中国还通过“一带一路”倡议与其他国家合作，推动“数字丝绸之路”战略，旨在加强数字经济、人工智能、纳米技术等前沿领域的合作，推动大数据、云计算和智慧城市建设。 例如，位于巴基斯坦首都伊斯兰堡和中国南部城市广州的中国-巴基斯坦智能系统实验室（英语：China-Pakistan Intelligent Systems Lab）。该实验室是由巴基斯

坦国立科技大学和广州软件应用技术研究院于2022年联合建立的项目，主要利用中国的交通管理系统等技术进行“智慧城市”项目的开发。

然而，数字丝绸之路倡议也面临着一些问题，最严重的是全球“数字鸿沟”。由于发展中国家与发达国家在数字基础设施成熟度与数字经济成熟度方面存在较大差距，造成信息与技术分布失衡，社会经济不平等现象加剧。此外，数字空间治理中面临的网络恐怖主义、网络犯罪等问题也迫在眉睫。 尽管如此，“数字丝绸之路”使中国能够将人工智能技术和基础设施出口到沿线国家。这不仅促进了中国与沿线国家的经济合作，还增强了中国在全球南方国家中的影响力。

（四）国际社会对中国人工智能模型发布的反应

中国的人工智能开发已经对全球政治产生了巨大影响。中国初创公司深度求索（英文：DeepSeek）发布的人工智能模型便是其中的一个例子，该事件发生在2025年1月20日。这一中国人工智能模型的发布轰动了美国市场。英伟达（英文：Nvidia）、博通公司（英文：Broadcom）、美光科技（英文：Micron Technology）和英特尔（英文：Intel）等人工智能硬件制造商的股价大幅下跌，市值缩水约1万亿美元，尤其是Nvidia的市值损失达到6000亿美元，跌幅高达16.9%，创下了单日历史最大跌幅。[2]

专家和投资者认为，DeepSeek的成功不仅可能动摇美国在人工智能领域的主导地位，还可能降低对美国芯片制造商产品的需求。投资者担心，少数几家支撑更广泛市场增长的科技公司，未必能兑现市场对其高价产品的期望。 尽管如此，另一些专家认为，DeepSeek-R1等模型的产生或将促使更多创新，加速人工智能的发展和普及，从而给整个行业带来好处。[3]

中国人工智能模型的发布并没有被政界人士忽视。2025年1月27日，美国总统唐纳德·特朗普（英文：Donald Trump）在讲话中对事件也作出评论。特朗普认为，对于人工智能技术的廉价化是积极的趋势，可以帮助美国公司采用更便宜的技术。特朗普还表示，DeepSeek的发布应当成为美国各行业的“警钟”。

然而，网络安全问题仍然是中国开发者面临的挑战。美国云安全公司Wiz在2025年1月29日表示，在开放存取中发现与DeepSeek相关的ClickHouse数据库。 ClickHouse是一个开源的数据库管理系统，旨在对大数据集进行快速的分析查询，广泛应用于实时数据处理和大数据分析。 Wiz表示，这一数据库包含大量聊天历史记录、内部数据和敏感信息。Wiz还提到，在发现该漏洞后，立即通知了DeepSeek，随后数据库的访问权限被关闭。

Wiz专家宣称，这个资料库包含了大量的聊天历史，内部资料以及机密资料。Wiz还表示，他们在发现这个漏洞后第一时间通知了DeepSeek，之

[2] 戚聿东.人工智能对我国经济发展的深刻影响[EB/OL].(2024.11.20)[2025.05.28].https://theory.gmw.cn/2024-11/20/content_37687718.htm.

[3] Trend Force. China’s Core AI Industry Achieved a Market Size of Nearly CNY 600 Billion [EB/OL].(2024.09.10)[2025.05.28].https://www.trendforce.com/news/2024/09/10/news-chinas-core-ai-industry-achieved-a-market-size-of-nearly-cny-600-billion.

后不久DeepSeek公司就关闭了数据库的访问权限。由于中国聊天机器人在人工智能领域引发的轰动，Wiz公司决定检查DeepSeek数据存储的可靠性。此案例充分体现了国际技术合作在人工智能安全领域的重要性。人工智能已成为中国加强其在国际舞台上影响力的途径之一。中国通过国际平台、双边关系以及自身的国际倡议，实施其长期政策，旨在巩固其国际地位。2025年1月的事件展示了中国在人工智能领域的研发如何影响全球进程。

（五）人工智能与安全：中国如何塑造未来

新型中国人工智能的发布导致了全球领先的西方人工智能和处理器研发公司股票的下跌，吸引了其他国家的政治家、记者、专家以及全球公众的关注。这类研发也可以视为中国“软实力”的一个重要组成部分，因为DeepSeek的发布引发了普通互联网用户的广泛关注。中国人工智能模型的成功展示了在当前条件下，使用较低的计算能力和更少的资源，也能够制造并训练人工智能。

然而，网络安全问题仍然是中国面临的重要议题。这个问题不仅涉及到沿“一带一路”倡议的中国合作伙伴，也涉及到中国本国的项目。网络安全问题无法单独解决，这也是为什么中国致力于与合作国家在这一领域开展合作的原因。随着人工智能的普及和成本降低，网络恐怖主义问题日益凸显，早已成为国际性问题。除了网络空间，恐怖分子还可能利用人工智能制造或编程武器，这也对现代国际安全体系构成挑战。

在军事领域，人工智能的使用问题愈发紧迫。当前，人工智能已被用于现代冲突中的军事无人机管理。随之而来的是有关使用这种武器的伦理问题，以及如何最大限度地减少对民用基础设施和非战斗人员的伤害。因为自主武器系统无法区分什么是正确的，什么是不正确的，所以决策的责任依然落在操作这些系统的人身上。因此，中国已经提出了旨在调整现代国际军事法的建议。中国还利用联合国、“一带一路”倡议等来推广其倡议。只有通过国际合作和协议，人工智能技术才能成为推动人类发展和繁荣的工具之一。

三、结论

迅速发展的人工智能深刻影响着国际关系，涉及经济、政治、外交、军事等多个领域。除了内部的人工智能监管，中国还积极参与全球人工智能治理，推动制定国际规则，提出了一系列关于人工智能伦理、数据安全和军事应用的倡议，尤其是在联合国的平台上。中国还通过“一带一路”倡议等项目提升在国际社会的影响力，将人工智能技术和基础设施出口到发展中国家。然而，中国的这些倡议也面临一些困难，尤其是“一带一路”倡议的合作伙伴在技术上的落后，以及缺乏统一的安全体系。

中国在人工智能领域的技术开发已经对全球科技和经济社区产生了影响。2025年1月末，中国DeepSeek公司发布的人工智能成为讨论的热点，引发了美国科技巨头股价暴跌。部分专家已经表示，这一事件是全球人工智

能竞赛的突破。[4]这一切可能加剧大国之间，特别是中美之间的技术竞争。这种竞争可能会导致两国之间的政治紧张局势升温，进而对全球产生影响。因此，随着人工智能技术的进一步普及，国际社会必须加强合作，共同应对与人工智能相关的挑战，确保人工智能技术的发展造福全人类。

参考文献

1. 国务院. 关于印发新一代人工智能发展规划的通知：国发〔2017〕35号 *[A]. 2017-07-20.*

2. 联合国大会. 加强人工智能能力建设方面的国际合作： *A/78/L.86[R]. 2024-06-25.*

3. 龙里县人民政府. 生成式人工智能服务管理暂行办法*[EB/OL].(2020.01.09)[2025.05.28].https://www.longli.gov.cn/zfbm/llxwhgdhlyj/zfxxgk_5719873/fdzdgknr_5719876/tyjs/202501/t20250127_86696772.html.*

4. 庞哲. 新时代“数字丝绸之路”发展困境及对策[J]. 合作经济与科技，2024（13）：*65-67.*

5. 戚聿东. 人工智能对我国经济发展的深刻影响*[EB/OL].(2024.11.20)[2025.05.28].https://theory.gmw.cn/2024-11/20/content_37687718.htm.*

6. 中国信息通信研究院. 中国数字经济发展研究报告(2024年)[R]. 第202406号. 北京：中国信息通信研究院，2024.

7. 中华人民共和国中央人民政府. 中国代表呼吁国际社会共同加强人工智能全球治理*[EB/OL].(2024-12-20)[2025-05-28].https://www.gov.cn/yaowen/liebiao/202412/content_6993839.htm.*

8. 中华人民共和国外交部. 中国关于规范人工智能军事应用的立场文件*[EB/OL].(2024-01-13)[2025-05-28].https://www.mfa.gov.cn/web/wjb_673085/zzjg_673183/jks_674633/zclc_674645/rgzn/202206/t20220614_10702838.shtml.*

9. Bose N. Trump: DeepSeek's AI should be a "wakeup call" to US industry [EB/OL].(2025-01-28)[2025-05-28].https://www.reuters.com/world/us/trump-deepseeks-ai-should-be-wakeup-call-us-industry-2025-01-27/.

10. China-Pakistan Intelligent Systems (CPInS) Lab. About Us [EB/OL].[2025-05-28].https://cpins.seecs.edu.pk.

11. ClickHouse. What is ClickHouse? [EB/OL].[2025-05-28].https://clickhouse.com/docs/en/intro.

12. Karaian J, Rennison J. China's A.I. Advances Spook Big Tech Investors on Wall Street [EB/OL].(2025-01-27)[2025-05-28].https://www.nytimes.com/2025/01/27/business/us-stock-market-deepseek-ai-sp500-nvidia.html.

13. Ministry of Foreign Affairs. The People's Republic of China. Remarks by China's Permanent Representative to the UN Ambassador Fu Cong at the UN

[4] 戚聿东. 人工智能对我国经济发展的深刻影响[EB/OL].(2024.11.20)[2025.05.28].https://theory.gmw.cn/2024-11/20/content_37687718.htm.

Security Council Briefing on Artificial Intelligence [EB/OL].(2024-12-09)[2025-05-28].https://www.mfa.gov.cn/eng/xw/zwbd/202412/t20241225_11517873.html.

14.Nagli G. Wiz Research Uncovers Exposed DeepSeek Database Leaking Sensitive Information, Including Chat History [EB/OL].(2025-02-25)[2025-05-28].https://www.wiz.io/blog/wiz-research-uncovers-exposed-deepseek-database-leak.

15.Rivas T. The End of American Exceptionalism? How DeepSeek Could Shatter the US Stock Market [EB/OL].(2025-01-28)[2025-05-28].https://www.barrons.com/articles/stock-market-deepseek-american-exeptionalism-e9363527.

16.Science Media Center. Expert reaction to new AI Chatbot DeepSeek [EB/OL].(2025-01-28)[2025-05-28].https://www.sciencemediacentre.org/expert-reaction-to-new-ai-chatbot-deepseek/.

17.Trend Force. China's Core AI Industry Achieved a Market Size of Nearly CNY 600 Billion [EB/OL].(2024.09.10)[2025.05.28].https://www.trendforce.com/news/2024/09/10/news-chinas-core-ai-industry-achieved-a-market-size-of-nearly-cny-600-billion.

DOI 10.34660/INF.2025.67.25.147

俄罗斯与中国：关于合作的主要方面
RUSSIA AND CHINA: ON THE MAIN ASPECTS OF COOPERATION

Gao Yue
PhD Student
Institute of Asian and African Studies,
Lomonosov Moscow State University,
Moscow, Russia

注释：俄罗斯和中国是世界地缘政治舞台上的重要参与者。两国都积极参与国际事务。它们都是联合国、上合组织、金砖国家等国际组织的成员，这有助于它们实现各自的国家利益。俄罗斯和中国在加强国际影响力方面取得了显著成就，其中包括建立牢固的俄中关系。在俄罗斯与西方国家关系紧张的背景下，国家间合作尤为重要。

关键词：俄罗斯、中国、合作、领域、经济、投资。

Annotation. *Russia and China are among the countries that are leading geopolitical players in the world. Both countries take an active part in world affairs. They are members of such organizations as the UN, SCO, BRICS, etc., which allows them to realize their national interests. Russia and China have achieved significant success in strengthening their influence in the world, including through the establishment of strong Russian-Chinese relations. Interstate cooperation is especially relevant in connection with the aggravated relations between Russia and Western countries.*

Keywords: *Russia, China, cooperation, spheres, economy, investments.*

The beginning of Russian-Chinese trade relations dates back to 1618, when the first official trip of Russian representatives to China took place to clarify trade prospects. On August 27, 1689, the first treaty between Russia and the Qing Empire was signed in Nerchinsk Fortress, which defined the border between the countries and established the first trade rules. Intensive development of diplomatic relations took place from 1924 to the 1990s. During this time, agreements were signed, including: “Agreement on General Principles for the Settlement of Issues between the USSR and the Republic of China” on May 31, 1924. December 12, 1932 - resumption of full diplomatic relations between the USSR and the Repub-

lic of China. Signing of the Treaty of Friendship and Alliance between the Union of Soviet Socialist Republics and the Republic of China, August 14, 1945. The USSR was the first to recognize the People's Republic of China on October 2, 1949. Active and progressive formation and development of trade and economic cooperation has been noted since the 1990s. Agreements were signed in various areas, for example: in 1992 - "Agreement on Economic and Trade Relations between the Government of China and the Russian Federation" and "Agreement on the Promotion and Mutual Protection of Investments". In 1992, the countries called themselves friendly states, and since then, Russian-Chinese relations have been developing in a favorable way.[5]. In 2001, the Russian-Chinese Treaty on Good-Neighborliness, Friendship and Cooperation was signed, which became the basis for modern relations. The current stage of bilateral relations is characterized by the strengthening of strategic partnership. The countries cooperate in the economic, scientific, educational and other spheres. In 2024, an agreement was signed to deepen relations of comprehensive partnership and strategic interaction. Russia and China participate in the implementation of joint projects, for example, in the field of industrial production, transport, logistics, agriculture, and mining.

Most experts believe that real Russian-Chinese cooperation has no analogues in world history[6], as it is implemented according to the model of "new type of great power relations"[7], corresponding to modern challenges and realities. Russian President V.V. Putin noted that Russian-Chinese relations are based on the key principles of mutual trust, equality, mutual respect, sovereignty and consideration of each other's interests[8]. Cooperation is actively developing between individual cities and regions of the Russian Federation and China, which is confirmed by the activities of the consulates of the two countries. Consulates headed by consuls operate under the general supervision of the Embassy of the People's Republic of China in Russia, in Moscow - this is the main diplomatic center coordinating all the work of consulates in Russia, in St. Petersburg - the cultural capital of Russia, in the Siberian region in Irkutsk, in the Urals in Yekaterinburg, in Kazan - the capital of Tatarstan, in the port city in the Far East - Vladivostok and also in Khabarovsk. Consulates of the Russian Federation are located in the cities: Beijing (at the Embassy of the Russian Federation), Shanghai, Hong Kong, Guangzhou and Harbin.

[5] Song Jiaxue. Current state of foreign direct investment from China to Russia // Finance and credit: guidelines for sustainable development. – P. 1079-1087

[6] Prokhin E.A. Russia and China: results of cooperation and prospects for the development of relations // Roscongress. 12/27/2022 – URL: https://roscongress.org/materials/rossiya-i-kitay-rezultaty-sotrudnichestva-i-perspektivy-razvitiya-vzaimootnosheniy-

[7] Rakhimov M.A., Paramonov V.V. Comparison of economic relations between Russia and China with the countries of Central Asia // Russia and the World: Scientific Dialogue. - 2021. - Vol. 1. - No. 1. - P. 52-66.

[8] Putin named the principles underlying Russian-Chinese relations // RIA Novosti. - 05/15/2024 – URL: https://ria.ru/20240515/kitay-1946026710.html

Regular meetings are held between the parties at the highest level. **The state visit of the leader of the PRC to Russia took place from May 7 to 10, 2025,**became a landmark event in the history of bilateral relations between the two powers. Following the talks in Moscow, the heads of state confirmed the high degree of trust and high level of interaction in the political, economic and cultural spheres. During the visit to Russia as the main guest to participate in the celebrations on the occasion of the anniversary of Victory in the Great Patriotic War, PRC Chairman Xi Jinping and Russian President Vladimir Putin exchanged views on the most sensitive issues on the bilateral agenda, as well as on regional and international issues.[9]At the Russian-Chinese Forum, which took place on May 19-20, 2025 in Khabarovsk, 34 agreements were signed, 25 of which were with representatives of foreign companies. The total amount of documents signed is more than 100 billion rubles.[10]

In the trade and economic sphere between China and the Russian Federation, there has been an increase in the volume of trade turnover since 2016, amounting to +350%. The highest increase occurred in 2021, which is obviously due to the intensification of foreign trade after the Covid-2019 pandemic. Also, the active pace of development of Russian-Chinese cooperation in foreign trade is explained by the consequences of anti-Russian economic sanctions since 2014 and Russia's reorientation towards friendly partners, including China. Since 2022, China has become Russia's main trading partner. According to the General Administration of Customs of China, in 2023, trade turnover between the countries increased by 26.3% and reached $240.1 billion. The increase was due to an increase in Russia's imports of engineering products (cars, equipment, etc.), and China's imports of energy resources. For China, Russia has become the fourth trading partner, but the one with which the maximum dynamics in terms of growth in trade turnover was recorded in 2023[11]. Russia supplies China mainly with hydrocarbon raw materials, such as oil, natural gas, liquefied natural gas (LNG), and brown coal. Since 2022, Russia has become the largest supplier of oil to China (1st place), natural gas (2nd place), and liquefied natural gas (3rd place)[12].

By the end of 2024, hydrocarbons accounted for more than 70% of Russia's exports to China: oil, coal, oil products, and gas. The value of these products'

[9] Ministry of Foreign Affairs of the Russian Federation // https://www.mid.ru/

[10] 34 cooperation agreements signed at the Russian-Chinese forum | Russian-Chinese forum 2025// https://ruschinaforum.ru/ru/news/na-rossijsko-kitajskom-forume-podpisali-34-soglashenija-o-sotrudnichestve

[11] Federal Customs Service of Russia (FCS) – URL: https://customs.gov.ru/statistic/vneshn-torg/vneshn-torg-countries

[12] Russia became the largest supplier of oil and gas to China in 2022 // Kommersant. 20.01.2023 – URL: https://www.kommersant.ru/doc/5775121

deliveries to China amounted to $95 billion.[13].Timber, seafood, and copper ore make up a large share of Russian exports to China. Cars, equipment, computers, smartphones, toys, clothing, and footwear are imported from China to Russia[14].

As of May 19, 2025, there are more than 9 thousand Chinese enterprises in Russia[15].Trade turnover between Russia and China in 2024 increased by 1.9% compared to 2023 and reached $244.8 billion. Of these: exports from China to Russia — $115.5 billion (an increase of 4.1%); imports from Russia to China — $129.3 billion. By 2030, Moscow and Beijing plan to increase mutual trade turnover to $300 billion.[16] Russian Ambassador to China Igor Morgulov announced the implementation of more than 80 joint projects with China worth $200 billion[17].

According to the head of the Russian Direct Investment Fund, Kirill Dmitriev, in 2025, Chinese businesses will invest in the following areas of Russia: energy, agriculture and food, infrastructure and construction, mechanical engineering**[18].** The total volume of imports of passenger cars from China to Russia is growing in 2024, amounting to 1.03 million units. According to the results of November, the volume of exports from China amounted to 550 thousand cars, which is 5% more than a year earlier. As expected, Russia took first place in car supplies from China in November, where almost 103 thousand passenger cars were delivered - approximately 18% of the total volume[19]. It is also important to highlight transport and infrastructure projects: construction of logistics complexes, development of road infrastructure, construction and reconstruction of highways, construction of gas pipelines. For example, here we can note such projects as: the gas pipeline “Power of Siberia - 2”, the high-speed highway “Moscow-Kazan” within the framework of the project “One Belt - One Road”, development of the infrastructure of the New Land Grain Corridor “Russia-China”, development of the Northern Sea Route[20].

[13] Trade turnover between Russia and China increased by 2% to $245 billion by the end of 2024 // https://www.infranews.ru/vneshnyaya-torgovlya/66671-tovarooborot-rossii-i-kitaya-po-itogam-2024-goda-vyros-na-2-do-245-mlrd-dollarov/

[14] General Administration of Customs China – URL: http://english.customs.gov.cn/statics/report/prelimin

[15] The number of enterprises with Chinese capital in Russia has exceeded 9 thousand// https://www.interfax.ru/russia/1026278

[16] China’s share in Russian exports amounted to 31% in 2024, in imports - 39% // https://www.kommersant.ru/doc/7460232https://www.kommersant.ru/doc/7460232

[17] Russia and China are implementing projects worth $200 billion //https://tsargrad.tv/novost/posol-rossii-kitaj-i-rossija-realizujut-proekty-na-200-mlrd_1272518

[18] The head of the Russian Direct Investment Fund Dmitriev spoke about the interest of large companies from China in Russia — 05/22/2025 — Economy on REN TV //https://ren.tv/news/ekonomika/1335753-glava-rfpi-dmitriev-rasskazal-ob-interese-krupnykh-kompanii-iz-kitaia

[19] China calculated how many cars were sent to Russia - Rossiyskaya Gazeta// https://rg.ru/2024/12/25/v-kitae-podschitali-skolko-avto-bylo-otpravleno-v-rossiiu.html

[20] Stepanenko A., Zhivikina Yu. Celestial technologies: what projects Russia is developing with China // RBC. 05.27.2024 – URL: https://trends.rbc.ru/trends/industry/665439809a7947f47f2527e2?from=copy

However, despite the rather optimistic situation that is developing today in the area of investment cooperation between Russia and China, a number of researchers draw attention to serious imbalances in this cooperation, which are characterized by an increase in Chinese investments in Russia and an insignificant volume of Russian investments in the Chinese economy.[21]This aspect is important, since the following is currently on the agenda: "the problem of carrying out comprehensive modernization and cooperation in order to increase the competitiveness of national economies"[22].

It is impossible not to note the interaction between China and Russia in the sphere of science, education, art and culture. In order to develop these areas, among other things, the "Russian-Chinese Roadmap in the Sphere of Humanitarian Cooperation until 2030" was developed, signed in October 2023. The document is of a strategic nature and regulates bilateral cooperation in the humanitarian sphere, including in the field of education.[23]. Chinese Ambassador to Russia Zhang Hanhui said that more than 44 thousand Chinese students are studying in Russian universities[24].The main areas of study chosen by Chinese students are philology, economics, linguistics, international relations, management, pedagogy, electrical energy, applied mathematics, and computer science.[25]etc. The number of Chinese students studying at Russian universities is 48 thousand, 16 thousand students from the Russian Federation study at universities in the PRC. This was reported by Russian Deputy Prime Minister Tatyana Golikova.[26] More than 80% of them pay for educational programs themselves, 20% study on the basis of scholarship programs. Russian students are mostly represented in institutes and universities of cities such as Beijing, Shanghai, Tianjin and Chongqing.[27]Joint Russian-Chinese University - MSU-PPI operates in Shenzhen. The co-founders

[21] Hao Xiaoyun, Didenko N.I. Analysis of the dynamics of foreign direct investment: countries of the China-Mongolia-Russia economic corridor // Economic sciences. - 2022. - No. 12 (217). - P. 455-462

[22] Zhumabekov M.U., Syzdykova Zh.S. International corridor "North-South": ways of forming Eurasian logistics// Issues of national and federal relations. Issue 8(113).2024. Vol.14. P. 2632.

[23] Russia and China plan to expand cooperation in education. Ministry of Science and Higher Education of the Russian Federation. 7.11.2023 – URL: https://minobrnauki.gov.ru/press-center/news/mezhdunarodnoe-sotrudnichestvo/75188/

[24] The PRC Ambassador to the Russian Federation revealed how many Chinese students study in Russia - Gazeta.Ru //https://www.gazeta.ru/social/news/2024/10/01/24048445.shtml

[25] There are 37,081 Chinese students studying in Russian universities. 03/22/2023 – URL: https://www.vedomosti.ru/society/articles/2023/03/22/967543-v-rossiiskih-vuzah-obuchaetsya-37-081-kitaiskii-student

[26] Golikova: about 48 thousand Chinese students study in Russian universities //https://tass.ru/obschestvo/21636417

[27] There are 37,081 Chinese students studying in Russian universities. 03/22/2023 – URL: https://www.vedomosti.ru/society/articles/2023/03/22/967543-v-rossiiskih-vuzah-obuchaetsya-37-081-kitaiskii-student

are Lomonosov Moscow State University, Beijing Polytechnic Institute and the Shenzhen Municipal People's Government. The key objective of the university is to train young specialists in China, based on Russian educational programs, who are necessary for the implementation of economic projects of the two countries in the Asia-Pacific region. According to the director of the Institute of China and Modern Asia (ICSA) of the Russian Academy of Sciences K. Babaev, several new joint Russian-Chinese universities may open in 2025, the campuses of which will be created in China.[28]. The university offers education in three languages: Chinese, Russian and English.[29]. In 2023, the Joint Engineering Institute was opened in Xuzhou. The project is being implemented by the Saint Petersburg Electrotechnical University "LETI" and the Xuzhou University of Technology. The main specialties in which Russian and Chinese students are trained are represented in the field of robotics, environmental engineering, and new energy technologies.[30] Scientific, technical and innovative cooperation between Russia and China is carried out in the following areas: the work of commissions and working groups on scientific and technical cooperation; the formation of joint coordinated Russian-Chinese scientific research projects, associations, scientific research centers and laboratories, funds for the support of scientific research, etc.[31] As part of the development of scientific and technical cooperation, a joint Russian-Chinese laboratory for superpowerful lasers for obtaining matter in states unknown to modern science has been operating in Shanghai since 2019. In 2021, the Russian-Chinese Research Center for Digital Economy began operating in Xiamen. In 2023, the China-BRICS New Era Science and Technology Incubator was opened.[32] Cooperation has developed in the field of 5G, industrial Internet, cloud computing and blockchain, as well as the digitalization of traditional infrastructure (transport, energy, power grids).

Cooperation between individual regions and cities of the two countries is developing. The Cooperation Program between the Moscow Government and the People's Government of Beijing for 2024-2026 is in effect, which affects the trade

[28] The Russian Academy of Sciences spoke about the creation of joint Russian-Chinese universities - RIA Novosti //https://ria.ru/20240519/vuzy-1946964049.html

[29] MSU-PPI University – URL: https://szmsubit.ru/o-nas/#

[30] Russia and China plan to expand cooperation in education. Ministry of Science and Higher Education of the Russian Federation. 7.11.2023 – URL: https://minobrnauki.gov.ru/press-center/news/mezhdunarodnoe-sotrudnichestvo/75188/

[31] Ulyanova M., Babonov Yu. Modern forms and mechanisms of interaction between Russia and China in the field of scientific and technical cooperation // Russian International Affairs Council. 13.12.2023 - URL: https://russiancouncil.ru/analytics-and-comments/analytics/sovremennye-formy-i-mekhanizmy-vzaimodeystviya-rossii-i-kitaya-v-sfere-nauchno-tekhnicheskogo-sotrud/

[32] Ulyanova M., Babonov Yu. Modern forms and mechanisms of interaction between Russia and China in the field of scientific and technical cooperation // Russian International Affairs Council. 13.12.2023 - URL: https://russiancouncil.ru/analytics-and-comments/analytics/sovremennye-formy-i-mekhanizmy-vzaimodeystviya-rossii-i-kitaya-v-sfere-nauchno-tekhnicheskogo-sotrud/

and economic sphere, includes projects in the field of culture and tourism, cooperation in the field of information and telecommunications technologies. Platforms in the direction of "green financing", in the field of creating a "smart city" system, in the field of artificial intelligence. According to statistical agencies, the volume of accumulated investments from China in the Moscow economy is more than $ 2.1 billion.[33]and it is planned to further increase their volume. The Chinese Cultural Center in Moscow (CCC) is a state institution of China, organized by the Ministry of Culture of China in 2012. The main objectives of the Center are cultural exchange between China and Russia, familiarization of Russians with Chinese culture and spiritual heritage. Representatives of the Center take part in bilateral cultural, educational, scientific and technical joint projects. Various cultural events, exhibitions, concerts, training courses, lectures and master classes are regularly held at the site of the Chinese Cultural Center.[34]

As of 2024, there are 19 Confucius Institutes and 5 Confucius Classes in Russia. They are located in Moscow, St. Petersburg, Volgograd, Novosibirsk, Irkutsk, Vladivostok, Kazan, Ulan-Ude, Tomsk, Ryazan, Yaroslavl, Blagoveshchensk and other cities. On September 19, 2024, a delegation from South Ural State University headed by Rector Alexander Shestakov signed an agreement and opened the Pushkin Institute center at Tianjin University of Foreign Languages[35]. The opening of the Pushkin Institute centers is being carried out on the instructions of the Ministry of Education and Science of the Russian Federation in accordance with the project "Creation and development of a network of Pushkin Institute centers in the PRC based on organizations providing instruction in Russian" within the framework of the implementation of the state program of the Russian Federation "Education Development".

In conclusion, it is also worth noting the joint work of Russia and China on international platforms and within the framework of integration unions, including the UN Security Council, the Shanghai Cooperation Organization, BRICS, the Association of Southeast Asian Nations (in the status of partners), etc. Within the framework of meetings on these platforms, Russia and China most often adhere to the same political line, which contributes to the further strengthening of bilateral relations and their progressive development. The formation of Russian-Chinese relations has gone through several stages, which can be divided into the emergence of relations, the development of diplomatic ties and trade and economic cooperation, as well as the modern stage. Currently, a new stage in the development of bilateral cooperation between China and Russia is taking place, including under the influence of transformation processes in geopolitics and the global economy.

[33] Moscow and Beijing signed a cooperation program for 2024-2026. 06/17/2024 – URL: https://tass.ru/mezhdunarodnaya-panorama/21120341

[34] Chinese Cultural Center in Moscow (CCC) – URL: https://www.moscowccc.ru/

[35] Opening of the Pushkin Institute Center in China - South Ural State University//https://www.susu.ru/ru/news/2018/09/21/otkrytie-centra-institut-pushkina-v-kitae

DOI 10.34660/INF.2025.62.69.148

重建美国：乔·拜登和唐纳德·特朗普之间，增长动力和“没落帝国”的阴影?……
REBUILDING AMERICA: BETWEEN JOE BIDEN AND DONALD TRUMP, GROWTH DRIVERS AND THE SHADOW OF A “FALLING EMPIRE”?..

Kharlanov Alexey Sergeevitch
Doctor of Economic Sciences, Candidate of Technical Sciences, Full Professor
Financial University under the Government of the Russian Federation, Moscow, Russia

摘要：作者描述了唐纳德·特朗普在保险和金融等关键市场的初步举措，评估了他的成功之处，并指出了特朗普过于简化的策略所带来的日益增长的风险。特朗普试图颠覆全球经济的整个格局，让美国在那些没来得及向他本人及其宏伟计划宣誓效忠的失败国家的残骸上再次伟大。

关键词：美国、俄罗斯、乔·拜登、唐纳德·特朗普、新自由主义、新保守主义者、特朗普主义、特朗普经济学2.0、俄罗斯、SMO、乌克兰、银行保险、加密货币、去中心化、人工智能、大数据。

Abstract. *the author describes Donald Trump's first moves in key markets such as insurance and finance, assesses his successes and identifies the growing risks that arise in D. Trump's oversimplified approach to turning the entire chessboard of the global economy upside down and allowing America to become Great again on the bones of the losing countries that did not have time to swear allegiance to him personally and his grandiose plans.*

Keywords: *USA, Russia, Joe Biden, Donald Trump, neoliberalism, neocons, Trumpism, Trumponomics 2.0., Russia, SMO, Ukraine, bancassurance, cryptocurrencies, dicapping, AI, Big Data.*

The May 2025 turmoil in search of peace for all warring parties is accompanied by a peaceful pause in Palestine, where Israel and Hamas reached another truce after the removal of their leader, who had held out for more than six months as the head of this radical organization. And the victims continue to cry out in the blood of the innocently murdered more than 50,000 women and children in Gaza, to the logic of a speedy peace and the beginning of a new reset, for the sake of which old conflicts are modified and temporarily frozen, the extreme ones are

found, and as a rule, the most defenseless and those who understand the big picture, in the unfolding tragedy, the perpetrators or accidental participants. America, which actively lobbies for the interests of Israel everywhere, and not only in the Middle East, is trying to hide its ears behind the “collective West”, and therefore our Russian sovereignty, which is being restored, bears traces of the influence of global governance institutions, being a hostage to the intricacies of many actors of corporatocratic, netocratic and bankster preferences, especially actively imposed in the era of neocolonial division of wealth and key competencies. Thus, the last years of Joe Biden’s presidency have supported the intensification of foreign capital activity in the US insurance market, which has led to the development of new trends in the activities of foreign branches. Bancassurance, i.e. the formation of financial groups with the participation of banks and insurance companies, has become widespread. Traditionally, the main channel for distributing insurance services was insurance intermediaries, but after the adoption of the Gramm-Leach-Bliley Act by Congress in 1999, the distribution of insurance services using banks has become increasingly popular in recent years, although the size of the bancassurance market in the United States still lags significantly behind other countries and regions of the world. In 2021, the size of the global bancassurance market reached 1.27 trillion US dollars, while in geographical terms, the leading position in the market is occupied by the Asia-Pacific region with a share of more than 40%, due to the growth of disposable income of the population and a favorable regulatory environment. The US accounts for about 3% of the market, which is primarily due to the country’s regulatory restrictions, which continue to maintain a division between bank distributors and insurance providers. In this regard, banks are limited to selling third-party insurance products to clients, especially the use of chatbots and AI neural networks, while the insurance market is dominated by more traditional channels such as agencies and brokers. However, the high level of penetration of the banking services market, the presence of large international competitors, the availability of domestic loans and tax advantages are the driving forces of the bancassurance market in the country, internationalizing the capital market and the means of payment themselves - from traditional loans, treasury bonds to cryptocurrency pools, which should, according to Donald Trump, lead America to a new financial infrastructure and make it the capital of all crypto payments worldwide. [1]

The US market is primarily driven by widespread consolidation in the banking sector, ongoing waves of mergers and acquisitions, and the formation of strategic alliances with European and Asian countries. In addition, the country is experiencing a significant increase in the elderly population, a “demographic winter”, which increasingly requires life and health insurance policies, as well as favorable pension plans, which is expected to give impetus to the bancassurance market and

support domestic growth in insurance services, in general. Since this interaction between banks and insurance companies serves as a one-stop solution for meeting multiple financial needs, it creates favorable prospects for the market. Moreover, the rapid digitalization of a number of bancassurance services in the US has given a significant boost to online sales. Some of the other factors contributing to the growth of the market include the continuous improvement of digital strategies adopted by numerous key players. The economic growth due to urbanization and the exponential growth of the private banking sector are likely to continue to drive this market segment in the coming years, creating various business schemes and launching online solutions on marketplaces and in various ecosystems. The changes in the distribution of foreign capital have affected not only insurance companies and companies, but have also affected intermediary organizations, especially sensitively against the backdrop of digital transformation and the ongoing US-China decoupling, which is especially aggravated during the periods of currency and tariff wars started by Donald Trump. [2]

This was manifested, on the one hand, in a reduction in the number of small-sized intermediary organizations, and, on the other hand, in the expansion of the process of mergers and acquisitions and the formation of international mega-brokers. For example, two of the world's largest insurance brokers, Aon and Willis Towers Watson, were formed as a result of the merger of capital from the UK and the USA. In 2021, the acquisition of Willis Towers Watson by Aon was supposed to take place for $30 billion, but, as noted above, the deal did not take place, since the US Department of Justice filed a lawsuit to stop the deal aimed at merging two global insurance brokers from the "big three" (the third broker is Marsh McLennan), since this merger could reduce competition and lead to higher prices.

In the past decade, attention has increased significantly to assessing the consequences of foreign investment inflows for national economies, and the United States is no exception. The Department of Justice and the Federal Trade Commission have begun to scrutinize transactions more thoroughly under antitrust laws, the Securities and Exchange Commission - special purpose acquisition companies (SPACs) and their targets, and the Committee on Foreign Investment in the United States - investments by Chinese companies and state-owned enterprises in American companies. After the announcement of such initiatives as "Made in China - 2025", "Digital Belt and Road" and "Internet +", China began to link its future with advanced technologies, which were traditionally considered the prerogative of Western economies. With the arrival of President D. Trump, China was officially recognized as a competitor in the global economy, and at the instigation of the presidential adviser on trade issues P. Navarro in 2018, the United States began to actively promote the thesis of the need to pursue a protectionist policy for the economic and scientific-technological containment of China in order to

ensure its further leadership. In addition to the introduction of tariffs, the creation of a "blacklist" of companies posing an immediate threat to US national security, which was headed by Chinese developers-leaders in the field of next-generation 5G communication systems, ultra-fast computing, semiconductor and integrated circuit developers, a number of laws and presidential decrees were passed. The Foreign Investment Risk Review Modernization Act (FIRRMA), passed in 2018, tightened the eligibility requirements for foreign investors in a number of economic sectors. According to the law, the Committee on Foreign Investment in the United States must be notified of "investments by foreign persons or companies in U.S. assets that involve critical digital infrastructure, critical and disruptive technologies, or sensitive personal information." [3] At the same time, the Committee on Foreign Investment has the authority to review completed transactions that it has not yet reviewed since 1988 (although approval from the chairman is required to review transactions completed more than three years ago). Moreover, in 2020, the Committee attempted to review without notification transactions completed as early as 2011 and earlier. Thus, obtaining committee approval on the condition that there are no unresolved national security concerns prior to the transaction provides a significant advantage: it eliminates the risk that the committee will subsequently review the transaction and attempt to mitigate its consequences by imposing restrictions on the foreign investor's access to or control over the U.S. business, or perhaps requiring the foreign investor to divest its stake entirely.

FIRRMA and its implementing regulations require the committee to focus on industries and sectors that have not previously been viewed as posing national security risks in the context of cross-border transactions. Among the U.S. businesses subject to the committee's enhanced scrutiny are so-called TID companies (technology, critical infrastructure, and personal data on U.S. persons) — businesses that collect or store certain types of "sensitive personal data" on U.S. persons. Such data includes data that falls into one of 11 categories, as E.V. Nebolsina notes, including: [1;4]

1) financial data that may indicate a difficult financial situation;

2) Credit history information;

3) Application data for health, liability, mortgage, or life insurance;

4) Information concerning an individual's physical, mental, or psychological health;

5) Private emails or other electronic communications;

6) Geolocation data, including data obtained from cell towers, WiFi hotspots, and wearable electronic devices;

7) Biometric identifiers, such as fingerprints and facial scans;

8) Data used to generate government identification;

9) Data concerning U.S. national security clearance status;

10) Data contained in U.S. national security clearance application forms;

11) Genetic test results. There is no doubt that the committee's oversight has an impact on FDI flows in the insurance sector, as insurance companies have access to sensitive personal data of citizens and critical technologies, including certain software and research and development activities, and therefore may be considered a national security risk.

This trend has led to a significant decline in the number of US SPAC IPOs and de-SPACs, horizontal and vertical mergers, and Chinese investments in the US. For example, in April 2021, China Oceanwide Holdings Group (China) withdrew its offer to acquire the equity of US life insurance company Genworth Financial for approximately $2.7 billion, suggesting that the US may hold up the deal due to concerns about the Chinese side's access to sensitive data [5]

Most likely, the general trend will not change during the presidency of Donald Trump, since his administration pays special attention to these areas. The current head of the executive branch's attempts to confront China also led to the US withdrawal from the Trans-Pacific Partnership (TPP). Opponents of the agreement, including D. Trump himself, believed that the deal would most likely accelerate the decline of manufacturing in the US, reduce wages and increase social inequality, the level of which is one of the highest in the world. This is obvious, because the pace of transition to the "knowledge economy", where the United States spends 25% of all global monetary and intellectual investments (up to 3.5% of GDP) on education and science, has yielded its own, including such ambiguous results.

In his interview with the Council on Foreign Relations during the Presidential campaign back in 2020, Joe Biden said that he approved of the idea underlying the TPP, adding that the US withdrawal put China in the place of the locomotive. The administration probably did not take into account the negative consequences of the decision to withdraw from the TPP:

1) as a result of the US withdrawal, China achieved a serious strategic advantage in Asia, thanks to its own competing free trade agreement and will now be able to dictate the rules of trade in Asia and, possibly, beyond;

2) the TPP would have led to significant economic benefits for the United States, namely, it would have expanded US trade and investment, including in the insurance sector, abroad, stimulated economic growth, reduced consumer prices and created new jobs, and also contributed to the promotion of US strategic interests in the Asia-Pacific region.

The first 100 days of Donald Trump, on the contrary, revised and audited the entire system of insurance and financial settlements: from NATO and the creation of its own European army in the Old World to the revival of the Bretton Woods institutions and the final departure from gold and oil-oriented dependencies, which should be in Industry 4.0. become oriented towards hybrid solutions

and the “green agenda” that requires lithium and polymetallic ores necessary for controlled regionalization in North and South America. This return to a new vision of the M. Monroe Doctrine will once again force the fiery-red owner of the Oval Office to rewrite a bunch of military and intelligence doctrines and scientific and philosophical concepts and engage not only in a war with Harvard for its true values and the quality of its graduates (blocking student grants for foreigners and depriving it of federal support, which is comparable to 35% of the Harvard Foundation’s endowment itself, and others that are not yet ready for such tectonic upheavals - universities, members of the “Ivy League”). [6] This means that the demand for the ideology of the new melting pot will now not be cheap and only for the rich and worthy countries and their representatives, who will still benefit from the power of the dollar and the retention of the advantages of American hegemony against the backdrop of the expected rebellion of the “global South” and the escalation of the European war between Russia and the “collective West” in Ukraine. The consequence of this is already the third increase in production within the framework of the OPEC + deal and leads to an even more scrupulous concentration of China, especially after D. Trump’s “golden rain” addressed to the Gulf monarchies financing both the military-industrial complex and Boeing, and the AI programs between Silicon Valley and the Middle East free economic zones, again exchanging their loyalty for raw materials and receiving for this repeated access to key Western technologies (this was partly already implemented at the end of the USSR), ready to share and revise neocolonial preferences during the new reassembly of America in Trumponomics 2.0. [7]

What Russia is ready to respond with in its attempts to make peace between Turkey and the Saudis, who are exhausting our foreign diplomacy in dealing with the illegitimate V. Zelensky and with Nezalezhnaya, which has lost its sovereignty, we will have to understand this summer and try to draw the right conclusions with the growing hegemony of the Anglo-Saxons...

References

1. Thesis by E.V. Nebolsina “The Role and Place of Insurance Services in the US Economy in the First Quarter of the 21st Century”. May, 2025.

2. Mooney A. Spotlight on Sensitive Personal Data as Foreign Investment Rules Take Force // McDermott Will & Emery: website. — 2020. — February 18. — URL: https://www.mwe.com/insights/spotlight-on-sensitive-personal-data-as-foreign-investment-rules-take- force/ (accessed: 30.05.2025).

3. Ramkumar A. The SPAC Ship is Sinking. Investors Want Their Money Back // Wall Street Journal: 2022. January 21. URL: https://www.wsj.com/articles/the-spac-ship-is-sinking- investors-want-their-money-back-11642761012 (accessed: 30.05.2025).

4. Mario Gabelli Sees Horizontal, Vertical M&A Environment // Bloomberg: URL: https://www.bloomberg.com/news/videos/2022-03-03/mario-gabelli-sees-2022. March 3. horizontal-vertical-environment-video (accessed: 05.03.2022).

5. Chinese Investments in the United States // American Enterprise Institute: https://www.aei.org/china-tracker-home/ (accessed: 30.05.2025).

6. Klein N. New national security regulations subject more insurance sector transactions to CFIUS review // Dla Piper: website. — 2020. — August 19. — URL: https://www.dlapiper.com/en/us/insights/publications/2020/08/new-national-security-regs-insurance- cfius/ (accessed: 30.05.2025).

7. U.S. sues to stop $30 billion global insurance merger of Aon and Willis Towers Watson // CNBC: website. — 2021. — June 16. — URL: https://www.cnbc.com/2021/06/16/us-sues-to-stop-30-billion- merger-of-aon-and-willis-towers-watson.html (accessed: 30.05.2025).

DOI 10.34660/INF.2025.62.66.149

背景知识对于非语言英语学生的重要性
THE IMPORTANCE OF BACKGROUND KNOWLEDGE FOR NON-LINGUISTIC ENGLISH LANGUAGE STUDENTS

Ilchenko Elena Vladimirovna
Candidate of Philological Sciences, Associate Professor
University of Science and Technology MISIS

摘要：本文探讨了对于专业活动不属于语言学领域的英语学习者来说，获取背景知识的重要性。要让学生及其培训机构的管理层相信，这些知识是掌握一门外语的系统组成部分，往往并非易事。

关键词：背景知识、背景信息、非语言学习者、文化语言特性、语言个性、跨文化交际。

Abstract. *This article focuses on the importance of acquiring background knowledge for the English language students whose professional activities are not in the sphere of linguistics. It is often difficult to persuade both the students and the administration of their training institution that such knowledge is a systematic part of the command of a foreign language.*

Keywords: *background knowledge, background information, non-linguistic students, cultural language peculiarities, language personality, cross-cultural communication.*

There is a broad consensus among foreign language teachers that a student's background knowledge is important for comprehension and facilitates building up the so-called "language personality" of a foreign language student, which is important, as their native language personality is usually different for obvious reasons: general background knowledge is often insufficient for profound understanding of a foreign language utterance, even if all the words are familiar to the addressee.

Unfortunately with non-linguistic students we often come across lack of enthusiasm in acquiring background knowledge both in the students and the administration of the educational institution. The common attitude is "we are not interested in the information which has nothing to do with our professional training." The argument often is that using the English language in a multicultural professional context as a lingua franca does not require acquaintance with the facts of British and American history, geography or literature.

This point of view stems from the total ignorance of the nature of a language, which is a tightly-knit system, integrating cultural information into its semiotic structure. Besides, even professional communication cannot be limited to the exchange of factual information. Without forming a "secondary language personality" a person will not be able to realize that mastering a foreign language is more than just learning some words and grammar rules. It makes the learner aware that other nations see the things differently because of the cultural language peculiarities: to illustrate that a simple example is the difference of words "hand" and "arm" or "fingers", "thumbs" and "toes" in English to their Russian equivalents, where only one word is used where the English language sees several different notions.

N.D.Galskova describes language personality as a multy-layer and multy-component system of language abilities, skills, readiness to carry out speech acts of different complexity including distinction of motives and competencies of the individual and their behaviour [1].

A.A.Vorozhbitova [2] introduced the term "professional language personality", stressing how important it is in spheres of "increased speech responsibility", such as law, diplomacy, pedagogy and medical professions to understand and be understood accurately.

It is common knowledge, that in the process of communication there are always discrepancies between what the addresser means and what the addressee perceives. The bigger their difference in age, gender, education, life experience, general background, the more difficult it is for the interlocutors to see each other's meaning clearly. This increases considerably when we deal with cross-cultural communication, especially if the language used is not native for either of the partners. If their language personalities are properly formed, it may help to bridge the gaps between their respective cultures and avoid misinterpretations caused by a kind of cultural shock, brought about by an unexpected language event [3].

This can be achieved by, among other things, acquiring background knowledge.

"Background knowledge" is often seen as a synonym to "language realia". The latter is sometimes interpreted as untranslatables or non-equivalent vocabulary (G.D.Tomakhin [4]), or as words and expressions for culture-specific material elements (S.Vlahov, S.Florin [5]). Conversely, E.M. Vereschagin and V.G. Kostomarov [6] claim, that "lexical background" is common to all national cultural language community, that almost every word carries associations often peculiar for this community or its part (e.g. people of the same generation). Realizing the importance of this aspect of word semantics promotes better understanding in cross-cultural communication and should be a part of a profound English language course.

V.S.Vinogradov introduced the idea of including background knowledge in the make-up of the semantics of a lexical unit, among such components as denotative (cognitive), emotive, emphatic, chronological, social and others [7]. This information may be long-term and short-term, the latter presenting considerable difficulties, as it is usually not reflected in dictionaries.

Even if a student does not acquire this kind of information in full, the awareness of its existence will prepare them for possibilities of a different nuance in a foreign word, like the fact that the adjective in “a rich man” in British English has a negative connotation, unlike in American English. It is also likely to protect them from native language cultural interference.

English language texts are full of cultural allusions, even though they may be scientific or technical. For example, a British author may include (most often in the title) a reference to well-known quotations – from Coleridge (The Rime of the Ancient Mariner), Wordsworth (Daffodils), Shakespear or even nursery rhymes.

So getting acquainted with the culture of the foreign language country not only contributes to the general development of a person, but is also useful in a practical professional way.

References

1. Galskova N.D. Modern foreign language teaching methods. Teacher’s manual. Moscow, 2000

2. A.A.Vorozhbitova Synergetic aspect of university education in view of linguo rhetoric approach. Alma mater. 1999. № 2. P. 22–26.

3. .https://www.tsutmb.ru/nauka/internet-konferencii/2020/09112020_prepodavatel/7/Zimina_Nohrina.pdf

4. G.D.Tomakhin Americanisms as Realia. Moscow, Vysshaya Shkola, 1988

5. S.Vlahov, S.Florin The translation of Realia. Osimo, 2022

6. M. Vereschagin, V.G. Kostomarov Language and Culture. Moscow: Indrik, 2005

7. V.S. Vinogradov, Translation: General and Lexical Problems. Moscow: KDU, 2006.

DOI 10.34660/INF.2025.35.34.150

语言与文化传播的跨媒介叙事
TRANSMEDIA NARRATIVES OF LANGUAGE AND CULTURAL COMMUNICATION

Semenov Vladimir Vladimirovich
Associate Professor
Moscow Humanitarian University

摘要："跨媒介叙事"对应英文transmedia storytelling，或者transmedia narratives，它与多媒体（multimedia）、跨媒体（intermedia）、跨屏传播（cross-media）都是媒体聚合过程中的重要术语，强调使用当前的数字技术在多个平台以及通过各种传播形式进行叙事。最近在教学过程中使用此类媒体扩展越来越普遍，尤其受到教师的欢迎。本文介绍跨媒介叙事在教学中的价值性和实用性。

关键词：跨媒介叙事，学习策略，叙事法，数字技术，媒体平台

Abstract. *"Cross-media narrative" refers to cross-media narrative, or transmedia narrative. It is an important term in the process of media convergence, parallel to multimedia, cross-media and transmedia. It emphasizes the use of current digital technology to tell stories on multiple platforms through various forms of communication. In recent years, the application of such media expansion in teaching has become more and more common, especially among teachers. This article introduces the value and practicality of cross-media narrative in teaching.*

跨媒介叙事是一种讲故事的技术，或通过使用多平台、跨媒介叙事系列来呈现故事的方式。新技术的发展使得每个参与者的经验能够融入到许多参与者的实时领域中进行交流，并且可以作为现实世界项目的替代方案。跨媒介叙事是各种相互关联的重述，以便更详细地扩展和描述原始宇宙。例如，英国作家 JK 罗琳的哈利·波特系列小说，首先是书籍和电影，然后是电脑游戏和游乐园。跨媒介叙事反映了日常生活的过程，并为教育系统形成了强大的教学结构。通过跨媒介技术叙事是当前千禧一代的特征，因为没有任何单一的信息传输渠道能够满足他们的好奇心并适应他们的生活方式。教育系统正在缓慢适应，但尚未准备好快速应对新文化的挑战。新文化的主要重点正在从个人自我认同的素养水平转向对自己作为社区一部分的认识。无论我们是否能够注意到这些过程，我们都生活在一个跨媒体信息传输的环境中，在一个文化和认知过程相互作用和互连的全球世界中。我们使用许多平台和沟通渠道进行交流，使用跨媒体叙事作为一种教

学工具，为学生提供互动参与的机会，将他们的意见、不同的观点和资源组织成一个统一的集体智力思维领域，从而吸引学生的注意力，给予他们归属感和分享经验的机会。跨媒体讲故事可以成为教育的一种工具，帮助学生掌握批判性思维技巧，识别材料，并以符合他们认知思维模式的形式获得知识。通过上述教学方法可以创建有价值的教学结构，进行职业指导和对学生系统的教育。跨媒体讲故事是从个人角度解释个人经历，为交流中的每个参与者提供引入新含义的机会。跨媒体允许学习者在静态图片之外释放数据可视化的所有可能性。每项学习任务的核心都是一个等待讲述的好故事。这些故事越来越多地通过多种设备和屏幕进行讲述，从而吸引更多的受众，让他们参与更深入的信息过程。

一，跨媒介叙事作为一种学习策略

跨媒体学习策略可以实现或至少极大地促进传承传统、接触现代这两项任务的平衡。 这种方法使得文化记忆不再是一个冻结的物体，而是一个不断变化的主体，利用数字能力来扩展文化遗产的经验。 如果采取正确的方法，它不会分裂，而是将几代人聚集在一起。

学生媒介素养水平的不断提高，能够体现在互联网上搜索所需的信息、快速查阅老师提供的信息、更快地掌握新技术和平台，这也可以被认为是对现代教育体系的挑战。 这不仅仅是抄袭和轻松找到老师问题答案的能力，也不仅意味着学习者总能在网络上找到与老师观点不同的信息，而是意味着我们早已进入跨媒体时代，它形成了一种特定的思维和感知类型，对所有参与者都施加了特殊的义务。

近几十年来，跨媒体叙事变得流行——使用不同的媒体格式同时讲述一个复杂故事的多个版本。例如，几乎同时发行一本书、一部电影和一款电脑游戏。与此同时，在不同的平台上，历史并不会真正重演，而是不断发展，让公众更多地了解《星球大战》等跨媒体项目的“宇宙”。为了让大众更容易、更刺激地深入探究叙事的所有细节，作者同时采用了多种体裁和多种情感冲击方式。跨媒体意味着公众已经准备好进行游戏交流。作者为受众提供适应不同平台和感知的多样化、个性化内容，创造高质量的多渠道沟通环境，提供项目各部分之间的集成链接，并定期更新信息。对于公众来说，他们期望的不仅仅是参与文本、视觉、视频和声音材料的被动消费，而是主动地与它们互动，与彼此以及与作者交流，并准备成为历史的共同作者。由于感知者的共谋，参与重新思考角色的目标和价值观，形成了语义和艺术的“分层”，使所有参与者沉浸在一个共同的交流空间和审美体验中。跨媒体以一种新的技术形式，让我们回到了学校文学教育的关键方法论原则，吸引学生发挥创造力，将他置于“小作家”的位置，我们不仅让他更容易理解文学古典遗产，发展了学生的个性，而且还将别人的个性转化为自己的个性，也就是说，我们提供了字面意义上的吸收典范文学文本的机会。跨媒体允许教师和学习者借助数字技术；技术同时仍然是一个从属工具，目标是进入文本、文学思维。因此，积极培养现代教师和学习者的跨媒体能力非常重要。国际研究结果表明，来自不同国家的

教育者和学习者正在教学和自学过程中积极使用媒体平台。然而，技术和用户实践在不断变化，今天在学习者中流行的东西明天就会被认为是过时的。教师知识的缺乏或对相关交流平台和实践的不熟悉会导致师生之间相互理解的程度下降，这有时被认为是对学生眼中现代文化的不尊重。教师和学生在现代水平上拥有广泛的跨媒体能力——视觉、声音，包括音乐、数字礼仪、流行电影、连续剧、视频游戏、标志性人物所依赖的大众文化情节知识—这可以极大地促进沟通过程和不同世代共同文化记忆的形成。教师在远程学习期间有效利用新平台和技术媒体机会的经验表明，强制过渡到远程学习已成为学校迈向“参与文化”的新阶段，邀请用户参与新学习的创建内容。就教育过程而言，参与者通过为共同目标联合起来的自组织群体的相互作用而获得的知识形成了所谓的集体智慧，这对于集体记忆和文化记忆的发展具有重要意义。

二，外语教学中的叙事法

就其本身而言，许多平台的发展并不会自动成为对现代性和现代教育挑战的回应。　技术可以帮助那些了解如何在新条件下利用新机会解决新问题或老问题的人。 在我们的案例中，既然我们谈论的是外语教学，我们将从叙事的概念开始——故事、情节、关于人们和他们所处的生活情境的叙述。

叙事方法作为跨媒体策略的一部分，在我们看来似乎是一种工具，可以帮助现代学生缩短书本中描述的理论与现代生活及其问题之间的距离。依赖叙事和原型情节之前已被用作教学方法。这让学习者看到不同时代的人们所关心的问题，以及人物面对相似困境时的不同动机。例如，旅行的主题是寻找教学材料中的情节和师生个人经历之间的类比和联系。

在准备创意任务时，教师依靠与学生对话中广泛的文化和历史联系，通过学生和教师的联合数字创意，落实共谋原则。以创作任务为基础的叙事方法不仅可以为学生提供一套来自外语文学作品英雄传记的“经典故事”，而且可以将教育任务的实施变成一种实践，让教育过程积极起来。跨媒体策略使每个学生可以选择方便的或适合该特定主题的不同媒体平台进行研究和艺术创作，有助于学生的自我决定，并使教师能够实现个人学习轨迹的想法。举个例子：人类重要文化需求的体现——通过自己或他人的艺术创造力来表达个人经历、内心世界：一组文本、诗歌、图像、绘画或照片、音乐作品。反思课程主题，学生可以在开放媒体平台上创建自己的“相册”，反映特定时代、特定人物的情绪。也许老师不仅能讨论课文，还能讨论其插图和电影改编，从而吸引学生的注意力。 因此，创造性任务的执行变成了一篇关于某个主题的文章，一种叙事的数字延续，一场视频讲座中老师引导下的讨论。在教学中使用叙事方法的另一种选择是沉浸在外语作品中，就像电视剧或电脑游戏的“宇宙”一样。 当然，外语作品本身并不意味着可以与之互动。但它可以被视为跨媒体项目的核心，在这个项目中，教师和学生发现自己处于导演的角色，使用各种讲故事的格式拍摄小说的某些部分。

外语流行艺术作品的业余延续并不比传统的学校戏剧作品差；它们将学生吸引到艺术和历史材料中，驱使他们以自己的自由意志饶有兴趣地澄清日常和地理细节，阅读并讨论，发展他们的外语技能。当然，主要任务是让学生了解主要内容：文本、复杂的陈述和叙述。

结束语

当然，在教学过程中单次使用此类媒体扩展可以被学生视为一种娱乐、一种吸引力。 但是，学生提出的叙述和形式越多、越多样化，他们在一个跨媒体故事中相互联系就越紧密，同学们的互动机会就越多，对教育的沉浸感就越深。

叙事方法和跨媒体学习策略不仅能让学习者有机会运用他们目前最了解的文化和科技能力，也有助于项目组内进行新能力的相互学习，以及培训教师，这也将对教育进程产生积极影响。 跨媒体策略将允许不同水平的学生一起学习，让每个人都有机会在共同任务的框架内完成个人任务，同时考虑到个人特征。

这种方法有其自身的特点，特别是学习过程的复杂性和评估的复杂性。然而，通过使用跨媒体讲故事，这些问题部分会被学生自己创造的事实解决。 这些内容将保留在多媒体平台上，以便教师与下一个班级一起继续开发项目，并积极让高年级学生参与教学低年级学生的过程，互惠互利，共同完成学习任务。

在这种情况下，老师要么扮演调解者的角色，要么扮演导师的角色。此类项目的公开性和连续性为学生创造了额外的动力，这些项目成为他们教育过程的重要组成部分，使他们能够进入公共领域。 因此，数字媒体在教育中的使用不仅有助于教材的开发，而且有助于整个教育过程的推进。

主要参考文献

1. Jenkins, H. Transmedia storytelling and entertainment. Journal of Media and Cultural studies, 2010.

DOI 10.34660/INF.2025.81.40.151

现代教育环境下的汉语与人工智能技术
CHINESE LANGUAGE AND ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE CONTEXT OF THE MODERN EDUCATIONAL ENVIRONMENT

Enikeeva Alina Ivanovna
PhD Student
Kazan (Volga Region) Federal University

Fakhrutdinova Rezida Akhatovna
Doctor of Pedagogical Sciences, Professor
Kazan (Volga Region) Federal University

摘要：本文探讨了人工智能 （AI） 技术在对外汉语教学中的应用潜力。文中探讨了包括使用聊天机器人、智能语音助手和虚拟现实系统等现代方法，以提升学习者的口语、听力和沟通能力。文章强调，人工智能的融合可以实现学习的个性化，增强学习动力，并帮助克服学习汉语过程中的语言、心理和教育挑战。此外，文章还强调，人工智能是对教师的补充，而非替代。

关键词：人工智能；汉语学习；聊天机器人；虚拟现实；智能助手；语言教育。

Abstract. *This article explores the potential of applying artificial intelligence (AI) technologies in teaching Chinese as a foreign language. It discusses modern approaches that include the use of chatbots, intelligent voice assistants, and virtual reality systems to enhance learners' speaking, listening, and communication skills. The article emphasizes that AI integration can personalize learning, increase motivation, and help overcome linguistic, psychological, and educational challenges in learning Chinese. It also highlights that AI serves as a supplement to, but not a replacement for, the teacher.*

Keywords: *artificial intelligence; Chinese language learning; chatbots; virtual reality; intelligent assistants; language education.*

In recent years, the rapid development of natural language processing technologies and related artificial intelligence systems has created both new opportunities and challenges for foreign language education. The emergence of powerful models such as ChatGPT has attracted increased attention to their potential use in education, including in the field of teaching Chinese as a foreign language. As noted, "the emergence of chat generative pre-trained transformer (ChatGPT) has aroused

widespread attention and heated discussions in the field of education, including the international Chinese language education" [Liu, 2023]. The integration of artificial intelligence technologies into foreign language instruction is already seen as a valuable support for both teachers and learners: "the integration of technology, especially artificial intelligence (AI), into teaching foreign languages is a blessing for teachers and learners" [Xia et al., 2024].

Modern AI technologies are widely applied in Chinese language learning. One of the most discussed areas is the use of conversational chatbots and generative language models. The emergence of Deepseek, GigaChat, ChatGPT, and similar systems has opened up new possibilities for language practice. Learners can engage in dialogue with a model in Chinese at any time and receive instant feedback. For instance, "ChatGPT... can engage in dialogues in Chinese. For Chinese learners, they can improve their oral expression by communicating in Chinese with ChatGPT" [Liu, 2023]. This simulates interaction with a native speaker, which is especially valuable when there is limited access to a real language environment. In addition, chatbots are capable of generating grammar explanations, translating texts, and even selecting exercises in an adaptive mode, adjusting to the learner's proficiency level.

Another promising direction is the use of intelligent personal assistants (voice assistants) to develop listening and speaking skills. Such assistants include voice agents like Xiaoice, Alisa, Siri, and others, which are capable of recognizing and producing speech in Chinese. Research shows that "intelligent personal assistants (IPAs) are a valuable tool in language learning because they provide opportunities for authentic interaction" [Wu et al., 2024]. According to several studies, regular practice with an AI assistant improves students' confidence in speaking. It has also been noted that the use of voice assistants positively influences oral language development and students' attitudes toward learning [Wu et al., 2024].

In addition to language models and assistants, virtual reality (VR) and augmented reality (AR) technologies are increasingly used in Chinese language education, and these tools are also enhanced by artificial intelligence capabilities. VR technologies create a strong sense of immersion in the language environment for students. For example, VR language-learning applications such as Mondly and Uptale allow learners to navigate through virtual spaces (e.g., shops, airports, cafes) and complete communicative tasks in Chinese.

A study by L. Shan [Shan, 2023] compares the popular commercial VR app Mondly with the educational platform Uptale, emphasizing the effectiveness of their AI-driven features for developing speaking skills among students with different proficiency levels. The study concludes that "VR technology, in general, enhances the Chinese learning experience" [Shan, 2023]. As Shan further explains, "the immersive nature of VR technology enables the creation of a contextual envi-

ronment that closely mirrors real-life, facilitating the achievement of both communication and language acquisition objectives" [Shan, 2023]. In other words, virtual reality engages multiple sensory channels and makes the learning experience more meaningful and practical.

The advantages and potential of AI in Chinese language teaching are considerable. First and foremost, AI enables a personalized approach to instruction. Machine learning algorithms can analyze each learner's progress and difficulties and adjust the level of tasks and the pace of instruction accordingly. As researchers point out, "AI-powered educational applications are useful for helping language learners overcome the commonly reported linguistic, psychological, and educational challenges... [they face] while learning Chinese" [Xia et al., 2024]. Thus, digital assistants can mitigate many of the difficulties typically encountered by Chinese language learners.

Qualitative research supports the effectiveness of such methods: "findings verify the effectiveness of AI-powered applications, such as ChatGPT, Poe, Brainly, and so forth, in helping teachers and learners of Chinese language learn grammar, structure, idioms, and cultural issues" [Xia et al., 2024]. In other words, AI tools have proven to be valuable for mastering a wide range of aspects in Chinese language learning from grammar and vocabulary to cultural nuances and communication strategies.

Another key benefit of AI in teaching is its ability to increase learners' motivation and engagement. Interactive learning formats with elements of gamification, powered by AI, make the process of learning Chinese more enjoyable and dynamic.

Despite its clear potential, the integration of AI into Chinese language teaching comes with a number of limitations. First, current AI systems do not yet possess a full understanding of language and context comparable to that of a human being. As researchers note, "speech recognition and natural language processing technologies still cannot completely and accurately understand human language" [Liu, 2023]. This means that in complex situations, such as unclear articulation, dialectal variation, or colloquial expressions AI may produce errors.

Second, the cultural and interpersonal dimensions of communication also present a challenge for artificial intelligence. An AI model lacks emotional intelligence and empathy; it cannot sense or respond to a learner's mood the way a human teacher can. Therefore, relying solely on chatbots for communication training is insufficient, and live interaction with teachers and peers remains essential for developing full-fledged sociocultural competence.

It is also important to emphasize the irreplaceable role of the teacher in the AI-enhanced classroom. No matter how advanced artificial intelligence becomes, it remains a tool in the hands of the educator. A human teacher brings creativity,

emotional connection, and pedagogical experience to the learning process—elements that are beyond the capabilities of machines. As Chinese colleagues aptly put it, “although the AI technology can provide intelligent teaching tools and personalized learning plans, it lacks human features, and cannot understand or care about students’ emotions as human teachers do” [Liu, 2023]. The teacher not only transmits knowledge but also fosters values, inspires by example, and creates a collaborative learning environment. All of this lies outside the reach of formal algorithms.

Even with the most sophisticated digital assistants, it is the teacher who assesses individual student needs and flexibly adjusts instructional methods. Moreover, the teacher’s responsibility is to guide students in using digital tools correctly, to critically evaluate information generated by AI, and to integrate it meaningfully into their learning.

Finally, technical limitations must also be taken into account. Many AI systems require large volumes of data and stable high-speed internet access, which may not be available in certain educational institutions or regions. Data security and privacy concerns become increasingly pressing when using AI-powered online services. It is essential to follow ethical guidelines, for example, avoiding blind reliance on translation apps that may produce inaccuracies, and proactively informing students that AI-generated text, such as from ChatGPT, may contain errors or biases and thus requires careful review.

The integration of modern technologies from virtual reality to intelligent assistants serves as a valuable complement to traditional instruction, increasing student engagement and helping to overcome common learning challenges. However, it is important to remember that even the most advanced digital tools cannot replace human interaction in education: “AI has its limitations and cannot completely replace traditional teaching. We need to re-examine the impact and challenges of AI on international Chinese language education” [Liu, 2023]. Therefore, it is the thoughtful combination of pedagogical expertise and new technological capabilities in Chinese language learning that best realizes its potential in shaping logically minded, well-rounded individuals.

References

1. Liu Y. Assist International Chinese Language Education. – 2023. – P. 254–257

2. Shan L. AI-enhanced adaptive Chinese language learning using VR “Mondly” app and “Uptale” platform // International Journal of Technology in Teaching and Learning. – 2023. – Vol. 19, No. 2. – P. 107–127

3. Xia J., Ge Y., Shen Z., Najar M.R. The Auxiliary Role of Artificial Intelligence Applications in Mitigating the Linguistic, Psychological, and Educational Challenges of Teaching and Learning Chinese Language by Non-Chinese Students // International Review of Research in Open and Distributed Learning. – 2024. – Vol. 25, No. 3. – P. 116–133

4. Wu J., Li Y., Zhou J., Chen S. The impact of intelligent personal assistants on Mandarin second language learners: interaction process, acquisition of listening and speaking ability // Computer Assisted Language Learning. – 2024. – Vol. 37, No. 5

DOI 10.34660/INF.2025.33.89.152

俄、汉、英新型职业名称结构人称特征比较
COMPARISON OF ONOMASIOLOGICAL FEATURES OF NEW PROFESSION NAMING STRUCTURES IN RUSSIAN, CHINESE AND ENGLISH

Manerko Larissa Alexandrovna
Doctor of Philological Sciences, Head of Department
Higher School of Translation and Interpreting at Lomonosov Moscow State University,
Moscow, Russia

Li Zisu
Postgraduate student
Lomonosov Moscow State University,
Moscow, Russia

摘要：职业名称和社会角色名称反映了劳动活动的历史发展，而这些名称的形成方式则揭示了语言的核心构词策略。本文从个人命名语言学的角度，对俄语、汉语和英语中职业名称的构词模式进行了比较分析。这三种语言的差异源于其基本的类型学差异，这种差异使得我们能够识别结构多样的语言中普遍存在的以及特定语言的个体命名机制——这是理解语言形式与认知模式之间关系的重要方面。研究结果可应用于词典编纂实践，尤其是新兴职业词典的编纂，以及比较语言学、个人命名学和翻译研究课程的教学。未来研究的一个有前景的方向是考察数字化、全球化和跨语言接触对职业名称构词模式变化的影响。

关键词：职业名称，个人命名学，构词法，俄语，汉语，英语。

Abstract. *Names of professions and social roles reflect the historical development of labor activities, while the methods of forming such nominations reveal the core word-formation strategies of a language. This article presents the comparative analysis of word-formation models for professional names in Russian, Chinese, and English from the perspective of onomasiological linguistics. These three languages are motivated by their fundamental typological differences, which allow the identification of both universal and language-specific mechanisms of naming individuals in structurally diverse languages – an essential aspect for understanding the relationship between linguistic form and cognitive models. The findings can be applied in lexicographic practice, especially in compiling dictionaries of emerging professions, as well as in teaching courses in comparative*

linguistics, onomasiology, and translation studies. A promising avenue for future research involves examining the dynamics of change in word-formation models of professional nomenclature under the influence of digitalization, globalization, and interlingual contact.

Keywords: *professional name, onomasiology, word-formation, Russian, Chinese, English.*

The relevance of this study is determined by the need to identify both common and divergent word-formation mechanisms used in the creation of professional names across languages with different typological structures – namely, in Russian, Chinese, and English.

The aim of the study is to conduct a comparative analysis of word-formation models for professional names in Russian, Chinese, and English, based on the onomasiological approach.

The research material consists of corpora of newly coined professional names collected from the website of the Ministry of Human Resources and Social Security of the People's Republic of China (for Chinese), the Ministry of Labor, Employment, and Social Protection of the Republic of Tatarstan (for Russian), and the U.S. Bureau of Labor Statistics (for English).

According to the data from the Ministry of Human Resources and Social Security of the People's Republic of China on May 9, 2025 the following new professional names were added in Chinese: 跨境电商运营管理师 *(cross-border e-commerce operations manager),* 无人机群飞行规划员 *(drone swarm flight planner),* 电子电路设计师 *(electronic circuit designer),* 装修管家 *(renovation supervisor),* 咖啡加工工*(coffee processing worker)* and others [Source: New Professions Released! 42 New Occupations Introduced: https://www.mohrss.gov.cn/SYrlzyhshbzb/dongtaixinwen/buneiyaowen/rsxw/202505/t20250509_541747.html].

In Russian, according to the Ministry of Labor, Employment, and Social Protection of the Republic of Tatarstan given on October 17, 2024, the following new professions were listed: *аквизитор (acquisitor), андеррайтер (underwriter), блокер (blocker), валеолог (valeologist), витражист (stained glass artist), декларант (таможенный) (customs declarant), джоббер (jobber), дилер (биржевой, валютный, торговый) (dealer – stock, currency, trade), евродизайнер интерьера (Euro-style interior designer), имиджмейкер (image consultant, including psychological and stylistic specializations), мастер по компьютерным сетям (computer networks specialist), неонщик (neon sign maker), пейджмейкер (page maker), сейлзменеджер (sales manager), экологический аудитор (environmental auditor), специалист по связям с общественностью (public relations specialist)*, among others [Source: Dictionary of New Professions: https://mtsz.tatarstan.ru/slovar-novih-professiy.htm].

In English, as it is based on data from the U.S. Bureau of Labor Statistics on April 18, 2025 the most professional names, which are in-demand, include as follows: *wind turbine service technicians, solar photovoltaic installers, nurse practitioners, data scientists, information security analysts, medical and health services managers, physician assistants, computer and information research scientists, physical therapist assistants, operations research analysts, occupational therapy assistants, actuaries*, and others [Source: Fastest Growing Occupations: 20 Occupations with the Highest Projected Percent Change of Employment Between 2023–33: https://www.bls.gov/ooh/fastest-growing.htm?utm_source].

The object of this study is the naming of professions in Russian, English, and Chinese.

In all three languages professional names may be formed as simple and derived words, word combinations, or even more complicated syntactic constructions. However, each of these constructions contains a headword (or nucleus) that serves as the core around which the entire structure – whether a phrase or a compound is built.

As noted by Nina Arutyunova, "nomination is a branch of lexicology that studies the naming of individual elements of a person's external and internal experience," as well as part of syntax, which deals with the designation of complete events and considers "the nominative aspect of a sentence and its transformations" (Koubryakova, 2016, p.10; see also Arutyunova, 1972, p. 299).

Scholars such as V.N. Teliya, E.S. Koubryakova, A.A. Ufimtseva, and L.A. Manerko emphasize that a key feature of the onomasiological approach is the analysis of how an object or action is receiving a linguistic expression.

According to L.A. Manerko, "the primary feature of the onomasiological approach lies in its focus on nomination processes and the creation of naming units" (Manerko, 2000, p. 69).

E.S. Koubryakova identifies three types of word-formation processes: "analogical, correlational, and definitional, each based on different understandings of the model and the rules governing the transition from a judgment to a name" (Koubryakova, 1981, p. 39).

As V.N. Teliya observes, "onomasiology proceeds from the object or phenomenon to the thought about it, and then to its expression by linguistic means" (Teliya, 2002, p. 458).

An important concept in this framework is the onomasiological structure, which includes:

1. Onomasiological basis – the referent of the nomination (e.g., agent or object);
2. Onomasiological feature – a characteristic or action related to the basis;

3. Onomasiological predicate – "the relation that connects the onomasiological basis with the onomasiological feature" (see Dokulil, 1962; Koubryakova, 1981, 2016; Manerko, 2000, p. 69 –70).

The position of word-combinations relative to nomination and syntactic units is illustrated in Figure 1 (Manerko, 2000, p. 57):

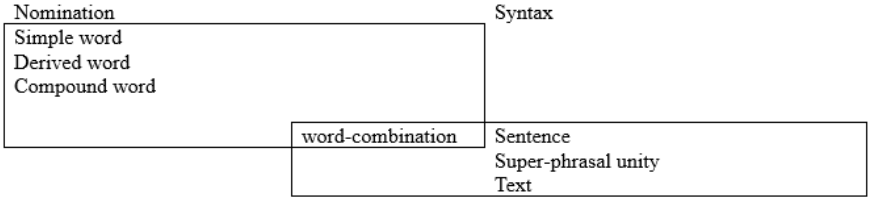


Figure 1. *The place of the word-combination among other nominative and syntactic units*

Word-formation serves as the primary mechanism for generating secondary nominations. As E.S. Koubryakova emphasizes, word-formation "is formed, exists, and functions as a domain for modelling motivated (secondary) nominations" (Koubryakova, 1978, p. 55). The structural components of such nominations vary according to the typological characteristics of the language.

According to Marina Stepanova, a word-formation model is "a prototypical structure with generalized lexico-categorial content that can be filled with various lexical materials" (Stepanova, 1979, p. 522). This definition is applicable to Russian, English, and Chinese alike, with allowances made for typological differences.

In all three languages, professional naming structures may consist of a simple word, a derived word, a phrase, or even a more complicated construction. However, every unit contains a headword (nucleus), which serves as the core around which the phrase or compound structure is organized.

In the Russian language, the following word-formation models are predominant for the creation of new professional titles:

1. Derived words with N + suffix structure: e.g., андеррайтер (underwriter; андеррайт + -ер);
2. Derived words with V + suffix structure: e.g., витражист (витраж + -ист, "stained-glass artist"), декларант ("declarant");
3. Word-combinations: e.g., мастер по компьютерным сетям ("computer network technician"), специалист по связям с общественностью ("public relations specialist"), экологический аудитор ("environmental auditor").

Examples of structural analysis include:

Мастер по компьютерным сетям (“computer network technician”) – structure: agent noun + preposition + complement (N + по + C);

Сейлзменеджер (“sales manager”) – a compound borrowing based on the English term sales manager.

So, the agentive component (the name of the professional) is typically positioned at the beginning of the construction, followed by specification components indicating the domain or specialization of the occupation. Alternatively, it may appear as an independent lexical unit – either a simple word or a derived one, typically formed with the help of suffixes.

“In Chinese, a noun may have several different modifiers. The order of these modifiers depends on their meaning and the relationships between them” (Ivchenko 2022, p. 114). Furthermore, “in the Chinese language, grammatical relationships between words in a sentence are expressed through word order and function words, such as prepositions, rather than through morphological changes” (Yakhontov 1965: 11). Languages in which grammatical relations are conveyed through word order or function words are typologically classified as isolating or analytic. “Thus, Chinese is an analytic language...” (Yakhontov, 1965, p. 12).

Examples from Chinese include:

跨境电商运营管理师 (kuàjìng diànshāng yùnyíng guǎnlǐ shī) – Manager of cross-border e-commerce operations (Adj + N + V + semi-suffix): 跨境 (Adj.: cross-border)电商 (N.: e-commerce; abbreviation of 电子商务)运营 (N./V.: operations)管理 (N./V.: management)师 (semi-suffix (Li 2023, p. 177: specialist, “-shi”)→ The agent noun 运营管理师 (operations manager) is formed via the model V + semi-suffix.

无人机群飞行规划员 (wúrénjī qún fēixíng guīhuà yuán) – Drone swarm flight planner(N + V + semi-suffix):无人机 (N.: drone) 群 (N.: group)飞行 (N./V.: flight)规划 (N./V.: planning)员 (semi-suffix: official, staff member (Semenas, 2005, p. 101), “-yuán”)

装修管家 (zhuāngxiū guǎnjiā) – Renovation supervisor (V2 + V1 + semi-suffix):装修 (V/N: renovation)管 (V/N: management)家 (semi-suffix (Li, 2023, p. 177): expert, “-jiā”)

Thus, the structural models for agentive nouns in Chinese generally follow the pattern: part of speech + semi-suffix, where the headword (中心语) appears at the end of the construction, preceded by compound modifiers.

In English, the study of agentive nouns has been the focus of numerous linguistic investigations. Among them, E.M. Pozdnyakova explored agentive categories in modern English from the perspective of cognitive linguistics. She identified a range of models for agentive noun formation, including:

Suffixal models derived from nouns, such as: N_1 + ist → N_2 (e.g., scientist), N_1 + er → N_2 (e.g., banker), N_1 + arian → N_2 (e.g., librarian), etc.; Compound noun models: N_1 + N_2 (e.g., project manager); Agentive models derived from verbs, including suffixal patterns: V + ant → N (e.g., assistant), V + er → N (e.g., writer), V + ery → N (e.g., bakery); Compound verb-noun models: V + N (e.g., pickpocket); Complex suffixal compounds: V + N + er (e.g., troubleshooter); Adjective-based models: Adj + er → N_2 (e.g., newcomer), Adj + ist → N_2 (e.g., specialist), Adj + N (e.g., foreign agent); Hybrid formations with combining elements: N_1 + a(o)holic → N_2 (e.g., workaholic), N_1 + smith → N_2 (e.g., wordsmith), N_1 + phone → N_2 (e.g., microphone) (Pozdnyakova 1999, p. 70–156).

These agentive nouns often serve as the core of multi-word expressions denoting professions. For example:

wind turbine service technician (Adj + N_1 + V + N_2 → N): wind (Adj.) + turbine (N_1) + service (V/N) + technician (N_2);

physical therapist assistant (Adj + N_1 + N_2, where N_2 = V + ant): physical (Adj.) + therapist (N_1 → V + ist) + assistant (N_2 → V + ant);

operations research analyst (N_1 + V + N_2, where N_2 = V + ist): operations (N) + research (V) + analyst (N_2 → V + ist);

solar photovoltaic installer (Adj + Adj + N, where N = V + er): solar (Adj.) + photovoltaic (Adj.) + installer (N → V + er).

The analyzed examples are all complex noun groups, often consisting of three or more elements arranged into analytical chains. The agentive noun, typically a noun with a suffix such as -er, -ist, or -ian, is usually placed in the final position and carries the main nominative function of the phrase.

Accordingly, Table 1 presents a comparison of the key structural features of agentive noun formation and profession naming models in Russian, Chinese, and English:

Table 1.

Comparison of profession names in Russian, Chinese, and English

Language	The model of the name of the figure	The position of the name of the figure
Russian	N (Noun) + suffix, V (Verb) + suffix, словосочетание	At the beginning or in isolation
Chinese	N (Noun) + semi-suffix	At the end of the construction
English	N (Noun) + suffix, V (Verb) + suffix	At the end of the construction

As a result of the conducted comparative analysis of professional designations in Russian, Chinese, and English, both universal and language-specific features of nomination have been identified. Regardless of the linguistic system, the central

element in the construction of a professional term is the agent noun, around which the entire structure of the unit is formed.

In Russian, affixal models of agent noun formation predominate, with the use of both simple and complex phrases including prepositions. The Chinese language demonstrates a different structure: professional designations are formed analytically, employing semi-suffixes and a strict order of modifiers preceding the head noun. In English, a significant number of complex constructions are observed, based on combinations of nouns, verbs, and adjectives, where the agent noun is often expressed through suffixation.

The application of the onomasiological approach allowed for the identification of the basis and the feature as structural elements of professional nomination and enabled tracing their realization across different linguistic systems. It was found that in English and Chinese, the agent noun is more frequently positioned in the final slot, whereas in Russian it typically occupies the initial or an independent position.

References

1. *Arutyunova, N. D. (1972). General linguistics. Moscow.*
2. *Dokulil, M. (1962). Tvoreni slov v destine I. Prague.*
3. *Dictionary of New Professions. Retrieved May 25, 2025, from https://mtsz.tatarstan.ru/slovar-novih-professiy.htm*
4. *Fastest Growing Occupations: 20 Occupations with the Highest Projected Percent Change of Employment Between 2023–33. U.S. Bureau of Labor Statistics. Retrieved from https://www.bls.gov/ooh/fastest-growing.htm?utm_source*
5. *Ivchenko, T. V. (2022). Chinese language: Complete grammar in charts and tables. Moscow: AST Publishing.*
6. *Koubryakova, E. S. (1978). Parts of speech in onomasiological perspective. Moscow: Nauka.*
7. *Koubryakova, E. S. (1981). Types of linguistic meanings: Semantics of derived words. Moscow: Nauka.*
8. *Koubryakova, E. S. (2016). Theory of nomination and word formation (Reprint edition). Moscow: Librocom.*
9. *Li, Z. (2023). Features of categorization of semi-suffixes denoting humans in Chinese. Modern Science: Current Problems of Theory and Practice. Humanities Series, (12/2), 175–178. Moscow: Scientific Technologies LLC.*
10. *Malinka, A. V., & Nagel, O. V. (2011). Lexical nomination: Onomasiological and cognitive approaches. Language and Culture, (4), 44–56.*
11. *Manerko, L. A. (2000). Complex-structured substantive phrase: Cognitive-discursive aspect based on technical literature of modern English (Doctoral dissertation). Moscow.*

12. New Occupations! 42 New Job Types Appear. Ministry of Human Resources and Social Security of China. Retrieved May 9, 2025, from https://www.mohrss.gov.cn/SYrlzyhshbzb/dongtaixinwen/buneiyaowen/rsxw/202505/t20250509_541747.html

13. Pozdnyakova, E. M. (1999). The category of agent noun and the ways of its synchronic development in cognitive and nominative aspects (Doctoral dissertation). Moscow.

14. Semenas, A. L. (2005). Chinese language lexicon. Moscow.

15. Stepanova, M. D. (1979). Word formation of modern German language (a brief overview). In A. N. Zuev et al. (Eds.), Dictionary of word-formation elements of the German language (pp. 519–536). Moscow: Russian Language.

16. Teliya, V. N. (2002). Nomination. In V. N. Yartseva (Ed.), Linguistic encyclopedic dictionary (2nd ed.). Moscow: Great Russian Encyclopedia.

17. Yakhontov, S. E. (1965). Ancient Chinese language. Moscow: Nauka Publishers.

DOI 10.34660/INF.2025.24.45.153

国语的形成是白俄罗斯民族巩固的因素之一（18–19世纪）

FORMATION OF THE NATIONAL LANGUAGE AS A FACTOR OF CONSOLIDATION OF THE BELARUSIAN NATION (XVIII – XIX CENTURIES)

Karatkevich Iryna Ivanauna
Candidate of Philological Sciences, Associate Professor,
Head of Department
Belarusian State University

摘要：在民族形成过程中，语言的共通性是至关重要的因素之一。白俄罗斯语的形成完成于15至16世纪，而从白俄罗斯民族到白俄罗斯民族形成的过渡则发生在18世纪末至19世纪上半叶，当时的条件不利于民族的巩固。对白俄罗斯历史、民族志和民俗学的研究，以及语言学和词典学著作的出版，促进了白俄罗斯人民族自我意识的形成，也客观地证明了白俄罗斯民族独立存在的事实。

关键词：白俄罗斯语，白俄罗斯民族，民族文化。

Abstract. *In the process of nation formation, the commonality of language is one of the most significant factors. The formation of the Belarusian language was completed in the 15th – 16th centuries, the transition from the Belarusian nationality to the beginning of the formation of the Belarusian nation occurred in the late 18th – first half of the 19th century in conditions unfavorable for the consolidation of the nation. Research into the history, ethnography, folklore of Belarus, the publication of linguistic and lexicographic works contributed to the formation of the national self-awareness of Belarusians, and also objectively attested to the fact of the existence of an independent Belarusian ethnos.*

Keywords: *Belarusian language, Belarusian nation, national culture.*

In the process of nation formation, a huge role is played by various factors that contribute to the consolidation of people into a single community. According to accepted scientific definitions, a nation is the highest form of an ethno-cultural community of people that arose on the basis of a certain nationality and "develops on the basis of the commonality of their [people's] territory, economic ties, features of the national worldview, mental appearance, common language, culture, historical destiny, customs and traditions…" [Shynkarov, Ramanava 2011, p. 275]. One of the most essential features of a nation is the common language of

people living together. As the most important means of human communication, language is involved in the process of forming a community of people in a certain territory, united by a common approach to economic activity and everyday life, and is the basis for the development of all forms of manifestation of national consciousness. Language reflects many components of national culture – the social structure, mentality and worldview of the people, etc., which will subsequently be passed on to future generations. Culture and language, interacting, shape the personality of a representative of the people – a native speaker, and therefore are an equally important part of the formation of a national worldview as another component of the nation.

Since the condition for the formation of a national (literary) language common to the entire ethnic territory is its use in all spheres of economic, socio-political, cultural life and public administration, it is important to consider the influence of the description and study of national linguistic facts on the formation of a specific ethnic community of people - the Belarusian nation.

The Belarusian nationality, united by a single statehood and origin of the population, a common ethnic territory, language, a certain cultural and economic unity, was formed in the 14th - 16th centuries as part of the Grand Duchy of Lithuania. In the 15th - 16th centuries, the formation of the Belarusian language was completed, which since the time of Francis Skaryna was called “simple Russian language”, “simple Russian dialect”. The self-designation “Belarus” is first encountered in the first half of the 17th century in Polish literature. The literary language of the Grand Duchy of Lithuania developed in official writing based on northeastern dialects (Vilnius-Polotsk-Vitebsk-Smolensk area). It was the state language, chronicles and state documents were created in it, diplomatic correspondence was conducted. The first books were written in this language: Psalter, Gospel, Catechism; legal books - “Statute of the Grand Duchy of Lithuania” (three editions). The 15th - 16th centuries are considered the “golden age” in the history of the Belarusian language, culture, literature. But as a result of the Union of Lublin in 1569, the federal state of the Polish-Lithuanian Commonwealth was formed and the Polonization of the Belarusian language began. In 1696, the Warsaw Sejm officially abolished the use of the Belarusian language in business documents. The official language in the Belarusian territories became Polish, and the Belarusian language, gradually supplanted by Polish in office work and culture, remained only in the living folk tradition.

In 1795, after the third partition of the Polish-Lithuanian Commonwealth, the Belarusian lands became part of Russia, and in 1840, the Russian Emperor Nicholas I issued an order to introduce Russian legislation and the Russian language in institutions in Belarus; it was even forbidden to use the name “Belarus”. At the turn of the 18th and 19th centuries, the Belarusian lands experienced the con-

sequences of numerous wars, as a result of which a large number of cities were destroyed and the urban population sharply decreased, the Belarusian merchant class and national intelligentsia practically disappeared.

Nevertheless, the period from the end of the 18th to the first half of the 19th century is the transition from the Belarusian nationality to the beginning of the formation of the Belarusian nation. This process took place in conditions of poverty and illiteracy of a significant part of the population, religious schism and anti-Belarusian orientation of the Orthodox and Catholic churches, schools, press, government institutions, which denied the existence of the Belarusian ethnic group and considered all Belarusians either Russians or Poles. Despite this, the consolidation of the Belarusian ethnic group into a nation was accompanied by a growth of national consciousness. Since the second half of the 19th century, the name "Belarus" and the ethnonym "Belarusians" have been increasingly used. According to the 1897 census, 74% of the population of Belarus considered the Belarusian language to be their native language [cited from: Latysheva 2009, p. 135]. The ethnonym "Belarusians" gradually replaced local terms such as "Litvins", "Black Russians", but did not yet have a common ethnic content. There were regional names ("Poleshuks"), self-designations based on confessional grounds ("Russians" and "Poles"), and residents of some parts of Belarus called themselves tuteishymi ("local", "native") [Encyclopedia of History of Belarus 1993, p. 472]. In the process of formation of the Belarusian nation, the formation of the national literary language was not fully completed due to a break in its functioning. Its development as a mechanism for transmitting ethnocultural information through religious institutions, education, and artistic culture resumed in the first decades of the 19th century and continued in the second half of the 19th – early 20th century, when after a long break the first Belarusian-language works of art began to appear. A characteristic feature of the initial stage of the formation of the modern Belarusian language was the absence of a single dialectal basis: works of art of this period had clear signs of speech native to their authors. Gradually, significant changes occurred in colloquial speech – a mixture of local dialects, changes in the vocabulary of the language: new words and terms appeared, Polonisms were replaced by Russianisms. But with all the dialectal diversity of the language of Belarusian fiction and journalism of that period, the process of formation of the literary language was most active in the center of Belarus (the zone between Vilno and Minsk). The lexical system of the living vernacular language of the central territory played an important role in the development of Belarusian scientific terminology, in particular, natural science and agricultural (names of animals and plants, names of traditional means of production related to crafts and occupations of the local population, etc.). The sound composition, grammar and vocabulary of the central Belarusian dialects formed the basis of the Belarusian literary lan-

guage and determine its modern appearance. In the new historical circumstances, the source of the development of the Belarusian literary language was oral poetic folk art. Belarusian authors widely used folk songs, fairy tales, proverbs, sayings, riddles in their literary works. The Belarusian literary language developed mainly as the language of fiction and partly journalism. The formation of the literary language was slow, which is explained by the difficulties in printing and distributing Belarusian-language works. Everyday vocabulary prevailed, industrial, legal, administrative and clerical terminology was poorly represented. A significant obstacle to the development of the Belarusian literary language was the lack of its codified grammar. But gradually the process of forming a graphic system, spelling and grammatical norms, enrichment of the vocabulary of the Belarusian literary language was underway. In parallel with the emergence and development of original fiction and journalism in the Belarusian language, work on collecting folklore works was intensified during this period (historical-ethnographic and folklore studies by P. Bobrovsky, T. Narbut, A. Bogdanovich, Ya. Borshchevsky, P. Bessonov, A. Kirkor, I. Nosovich, E. Romanov, A. Pypin, N. Nikiforovsky, A. Serzhputovsky and others). Simultaneously with folklore publications, scientific studies of Belarusian dialects appeared, and the first lexicographic works were compiled (I. Nosovich [Nasovich 1983], E. Romanov [Romanov 1901; Romanov 1912], P. Shein [Shein 1874], etc.).

Thus, in 1822, the researcher of Old Russian and Slavic writing K.F. Kalaydovich prepared for publication the works of Kirill Turovsky (an Old Belarusian writer, preacher, church figure, saint of the Uniate Church) and compiled a short dictionary of the Belarusian language in the article "On Belarusian Speech," in which he first used the name "Belarusian language" in the context of East Slavic writing [Kalaydovich 1811, pp. 16-18]. Belarusian historian, archaeographer, writer, local historian, collector of manuscripts on the history of Belarus, priest I.I. Grigorovich published the first national archaeographic collection "Belarusian Archive of Ancient Letters" (unique documents on the history of Belarus, Lithuania, Ukraine of the 14th – 17th centuries) in 1824, participated in the preparation and publication of "Acts of Western Russia", in the 1840-50s he was involved in compiling a dictionary of the Belarusian language, but did not manage to finish the work – only manuscripts for the letters A, B, V have survived [Grygarovich 1996, p. 162].

1. Around the same time, the Belarusian ethnographer, folklorist and linguist I. I. Nosovich compiled his explanatory and translation "Dictionary of the Belarusian Language" over the course of 16 years. This is more than 30 thousand units of vocabulary and set verbal constructions of the living Belarusian language, which were recorded in the Mogilev, Vitebsk and Minsk provinces and provide extensive information about the material

and spiritual culture, life, religious and social structure of the population of the Belarusian lands [Savitskaya 2020, pp. 199-208]. This dictionary reflects various groups of vocabulary that characterize the life of the Belarusian people in the 50-60s of the 19th century, including the vocabulary of folk crafts - fishing, beekeeping, cooperage, iron processing, etc.

2. The collected and systematized folklore and dictionary materials allowed a wide range of interested people to become more closely acquainted with the lexical composition and phraseology of the living folk language, created the necessary conditions for a deep and detailed study of its features. This was of great importance in the complex process of the formation of the modern Belarusian language, the establishment of its national specificity, in the selection of the most characteristic and at the same time the most expanded means for national communication from among the treasures of linguistic creativity accumulated over the centuries. Publications of fundamental scientific works devoted to the Belarusian people, their language, culture and historical past contributed to the formation of national self-awareness, objectively testified to the fact of the existence of an independent Belarusian ethnic group.

References

1. Grygarovich Ivan Ivanovich // Encyclopedia of the History of Belarus: In 6 volumes. Vol. 3. Gymnasium - Cadence. Minsk: BelEn, 1996. Page 162.

2. Kalaydovich K.F. News about the antiquities of the Slavic-Russians and about Ignatiy Ferapontovich Ferapontov, the first collector thereof. Moscow: University Press, 1811. 21 pages.

3. Latysheva V.A. Population censuses of 1897 and 1926: signs of national self-determination of Belarusians // Historical and special historiographic data: scientific collection. Issue. 5. Minsk: BSU, 2009. P. 134-142.

4. Nasovich I.I. Dictionary of the Belarusian language. Minsk: BelSE, 1983. 792 p.

5. Romanov E.R. Belarusian collection. Issue 9: An attempt at a dictionary of conventional languages of Belarus with Great Russian, Little Russian and Polish parallels. Vilnius: A.G. Syrkin Printing House, 1912. 124 p.

6. Romanov E.R. Katrushnitsky lemenen. Conventional language of the Dribin shapovals. Saint Petersburg: Printing House of the Imperial Academy of Sciences, 1901. 44 p.

7. Savitskaya I. I. The Belarusian Language Dictionary by Ivan Nasovich: Ethnic Linguistic Commentary // Acta Albaruthenica. 2020. Vol. 20. Pp. 199-208.

8. Shein P.V. Belarusian Folk Songs, with Related Rituals, Customs, and Superstitions, with an Explanatory Dictionary and Grammatical Notes. St. Petersburg: Maikova Printing House, 1874. 570 p.

9. Shynkarov V.V., Ramanava S.P. Belarusian Political Dictionary. Minsk: Education and Nurture, 2011. 576 p.

10. Encyclopedic histories of Belarus 6 vols. T. 1. A – Belitsa. Minsk: BelEn, 1993. 494 p.

DOI 10.34660/INF.2025.45.13.154

俄罗斯媒体平台推广中国汽车的传播策略语言层面
LINGUISTIC ASPECTS OF THE COMMUNICATION STRATEGY FOR PROMOTING CHINESE CARS ON RUSSIAN MEDIA PLATFORMS

Moldavskaya Olga Evgenievna
PhD in Philology, Associate Professor
National University of Science and Technology MISIS

Romanova Alina Romanovna
Student
National University of Science and Technology MISIS

摘要：本文探讨了在俄罗斯市场推广中国汽车品牌（尤其是奇瑞品牌）的广告策略所使用的语言特征。研究分析了俄罗斯媒体平台上播放的宣传视频以及社交网络上的媒体文本。

关键词：媒体语言分析、战略传播、语言成分、目标受众、语言特征。

Abstract. *This article examines the linguistic features used in advertising strategies for promoting Chinese automotive brands on the Russian market, with a focus on the Chery brand. The study analyzes promotional videos broadcast on Russian media platforms, as well as media texts from social networks.*

Keywords: *media linguistic analysis, strategic communication, linguistic components, target audience, language features.*

The relevance of this research is determined by the transformation of media consumption, both locally and globally. First, the entry of Chinese brands into the Russian market requires adapting strategic communication to consumer demands and the realities of the Russian Federation. Second, new trends and requirements for advertising content have emerged worldwide, leading to the personalization of ad campaigns on media platforms. Therefore, the goal of this study is a media linguistic analysis of advertising strategies and key brand messages from Chinese automakers, as well as their perception by Russian viewers across different target audiences. The ultimate result is an answer to the question: Which linguistic components positively or negatively influence the choices of Russian consumers?

The research material consists of promotional messages from the Chinese automotive brand Chery, published on Russian media platforms in 2024, includ-

ing textual and visual components. Chery is a Chinese automobile manufacturer founded in 1997. For video sampling, two Russian media platforms were selected—RuTube and VK Video. Additionally, brand channels on Telegram and VK were chosen to examine advertising posts and their consistency.

First, we analyze a video advertisement due to its informativeness and visual richness. The video tells the story of a father and daughter on a journey together, discussing personal confidence and strength that family gives. The climax features the father participating in a challenging football match, where his wife's words inspire him, leading the team to victory. Simultaneously, viewers see footage of the family's car. This combination of product visualization and the protagonists' victory creates an association between family imagery and the reliability of the promoted vehicle.

The prevalence of warm tones in the video, along with nonverbal elements like smiles and family hugs, evokes a sense of comfort and nostalgia in the audience [1].

Phrases such as "That's where my strength lies," "With you — yes," and "My victories are our victories" indicate a conversational style. The use of informal "you" ("ty" in Russian) and inclusive phrases like "we, ours" minimizes the distance between the message and the viewer. This communication style makes the audience feel like part of the "family" depicted in the advertising message, projecting the story onto their own lives and evoking feelings of warmth, love, and motivation.

The ad's goal is to create a positive brand image and associate the car model with the target audience. Rather than highlighting technical features, it emphasizes emotional benefits:

1. safety and confidence. The response "With you — yes!" underscores the protection and assurance a child feels with their father, extending this emotional advantage to the car itself. Thus, the brand's vehicles symbolize peace and security for the whole family;
2. pride in family achievements. Lexical repetition fosters joy for the family's accomplishments, suggesting the car will help achieve even greater milestones together;
3. sense of belonging. The advertisement emphasises the themes of mutual support and trust within the family. Messages like "My victories are our victories" evoke a sense of unity in the viewer. Thus, the ad conveys that the car will help customers strengthen family bonds and spend more time with loved ones.

This media text leaves a highly positive impression, aligning with Russia's current socio-economic profile. Emphasizing traditional values enhances emotional appeal and resonates with prevailing social trends.

We will now turn to an analysis of social media advertisements. The first ad post highlights that every car enthusiast can find a model they like. The visual component allows us to observe several car models. Moreover, the slogan “Select your defender” and the headline “Chery for everyone” create an image of a diverse product lineup catering to various needs and preferences of potential customers. While the message structure may generate ambivalent responses, it successfully directs potential customers further down the sales funnel [2].

The slogan “Chery for everyone” clearly employs dialogic communication and creates a sense of personal address to potential buyers while alleviating the adversities of car selection uncertainty.

Moreover, an invitation to a live stream fosters direct engagement, letting them become active participants who can ask questions in real time.

The visual component paired with the slogan “Select your defender” perfectly demonstrate advertising clarity. Even without reading the text the key message is brief and concise. The slogan creates a striking visual identity, while images of different models reinforce both visibility and a sense of abundant choice.

Imperative verbs “scroll”, “choose” reinforce a conversational tone, making the brand seem responsive and friendly. The following phrasing creates the impression of direct, personal communication with the brand. Simultaneously, the second message block employs verb forms and plural possessive pronouns ‘our,’ ‘we’ll show,’ ‘we’ll answer’ which fosters a sense of unity and community in the consumer’s perception. This allows the brand to project an image of being responsive, friendly, and cooperative. The strategic combination of these varied verb forms helps capture attention, engage potential customers, and establish trusting, warm relationships with them.

Consequently, the advertising message aims to both highlight the wide range of the brand’s offerings and increase consumer interaction with its premier product line.

The analysis reveals this media text primarily focuses on the emotional attributes of the commercial offerings. The following emotional advantages are particularly emphasized:

1. freedom of choice and personalisation. The stylistic devices mentioned earlier demonstrate the copy’s intent to convince consumers that the company has crafted offers tailored specifically to them.
2. reliability and convenience. The text’s linguistic features emphasize confidence in the product’s performance across diverse conditions.

The visual design overtly showcases the brand’s extensive product range. Light color tones and scenic backdrops create positive impressions while capturing the viewer’s attention.

However, a contradiction arises between “Chery for everyone” and the focus on a flagship model, potentially alienating some readers.

Another advertisement message focuses on showcasing the functional advantages of the product offering, taking into account the interests of all family members. Through the visual and textual components of the message, the reader can understand that this car provides convenience for both the driver and the passengers. The text structure is clear with benefits divided into categories ("For Mom," "For Dad," "For Kids") and a visual representation of the advantages in the images. The ad emphasizes the car's comfort and convenience while guiding readers to the next stage of the sales funnel by encouraging them to join a live stream. Elements such as urgent timing, "today at 1:00 PM", and the opportunity to watch a test drive of the car in unconventional conditions (off-road on a mountain serpentine) help spark greater interest in the product among potential customers [3].

Despite the considerations mentioned before, this messaging may elicit mixed reactions, particularly among female audiences. The fact that the visual component centers on a male protagonist positioned as the head of the household while attributing secondary benefits to women (e.g., "convenient when shopping is successful") risks creating a negative impression. While accounting for extralinguistic factors, where traditional values in advertising are often appreciated and positively received, this specific execution may inadvertently convey gender bias, alienating a significant portion of the target audience.

To mitigate such adverse effects and reinforce the image of harmonious family engagement, we recommend diversifying the visual narrative. This could include alternating depictions of drivers (both male and female) and integrating functional benefits that resonate equally across genders.

Rhetorical questions actively engage readers in reflection while creating a sense of personal connection - "How can you make every journey truly enjoyable...?" The strategic categorization of functional and emotional benefits by family member enhances information clarity and improves structural organization.

The media text employs elements of colloquial style. Phrases like "Nothing beats a successful shopping experience" and "Relax in traffic and forget about winter worries" maintain an informal atmosphere while demonstrating the brand's customer-centric approach.

The purpose of the message is to convince potential buyers that the sales offer is the ideal option, taking into account the interests and convenience of all family members. Accordingly, this will help stimulate potential customers' interest, attract an audience to the live broadcast, and provide additional motivation to learn more about the car.

The promotional message highlights the functional advantages of the product:

1. powerful engine;
2. advanced transmission;
3. spacious trunk and etc.

Emotional benefits:

1. family harmony. There's room for everyone in the car, and most importantly, each person will find a feature they love, whether it's fast connectivity or a roomy trunk;
2. durability and comfort. The powerful engine, automatic transmission, and intelligent all-wheel drive provide confidence on the road in any conditions.

To get a comprehensive overview, it is necessary to examine one more brand's media text. It is a message that highlights the functional advantages of the brand's hybrid cars. The visual component includes an image of the car and owls, which are traditionally a symbol of silence. Moreover, the key message "Quiet and Powerful" reinforces the effect and creates a connection between the natural element and the car's technological sophistication. The message is concise and effectively conveys the key benefit of hybrid vehicles so that the reader instantly grasps it, even without engaging with the main text.

From a grammatical point, attention should be paid to the use of imperative verbs such as "Subscribe" to add a directive tone. The presence of terminology specific to the automotive industry "hybrid cars," "innovative" helps create an image of progressiveness. At the same time, the text does not come across as dry, as it is filled with expressive language, lending a sense of vitality and strength to the brand's statements.

The aim of the message is to achieve a perlocutionary effect by emphasizing the values of hybrid models, which are sustainability, quietness, and power. Thus, the following key values can be identified:

1. innovation and sustainability;
2. comfort and connection with nature.

A total of 112 linguistic features were found to convey specific imagery and values. The brand's materials demonstrate a strong focus on developing family-oriented imagery, which ranks first in terms of frequency. Additionally, the themes of technological advancement and strength also play a significant role in the brand's media texts.

References

1. SimilarWeb. VK.com: [https://www.similarweb.com/ru/website/vk.com/#overview]. – 2025.

2. SimilarWeb. Telegram.org: [https://www.similarweb.com/ru/website/telegram.org/#overview]. – 2025.

3. CHERY Russia: [https://www.chery.ru/chery/about/facts/]. – 2025.

DOI 10.34660/INF.2025.34.81.155

契诃夫短篇小说《带阁楼的房子》中的“非具身”诗学
POETICS OF “NON-EMBODIMENT” IN A. P. CHEKHOV’S STORY “THE HOUSE WITH THE MEZZANINE”

Ivanova Elena Stanislavovna
Candidate of Philological Sciences, Associate Professor
Belarusian State University

摘要：本文致力于分析A.P.契诃夫小说《带阁楼的房子》中“非具象化”的诗学。作品中的关键意象——庄园、阁楼、沃尔恰尼诺夫姐妹和无名艺术家——被认为是契诃夫美学中不完整、逃避和根本性非现实性的体现。文章特别关注艺术空间的象征意义：阁楼被解读为现实与想象之间的边界，反映了人物的情感状态。故事中的一切都充满“幽灵”：未言明的爱情、被剥夺了心理完整性的人物，以及象征着一个正在消逝的时代的房屋和庄园。本研究展现了契诃夫如何改造传统的庄园时空体，并赋予其新的内容——幽灵般的诗学、未实现的可能性以及“消失”的现实。

关键词：A.P.契诃夫、《带夹层的房子》、非具象化、时空体、庄园、象征主义、印象派。

Abstact. *The article is devoted to the analysis of the poetics of “non-embodiment” in A.P. Chekhov’s story “The House with a Mezzanine”. The key images of the work are considered – the estate, the mezzanine, the Volchaninov sisters and the unnamed artist – as the embodiment of Chekhov’s aesthetics of incompleteness, elusion and fundamental non-realization. Particular attention is paid to the symbolism of the artistic space: the mezzanine is interpreted as a border zone between the real and the imaginary, which reflects the emotional state of the characters. Everything in the story is “ghostly”: love that remains unspoken, characters deprived of psychological completeness, the house and the estate as a whole as a symbol of a fading era. The study demonstrates how Chekhov transforms the traditional estate chronotope, filling it with new content – the poetics of ghostliness, unrealized possibilities and “disappearing” reality.*

Keywords: *A.P. Chekhov, “The House with a Mezzanine”, non-embodiment, chronotope, estate, symbolism, impressionism.*

“Missyuss, where are you?” – this question, thrown into the void, could become an epigraph to all of Chekhov’s work. The writer, who came to literature

at the end of the 19th century, developed a strategy for creating subtext based on the intentional "emptiness" of meaning, restraint, silence and the aesthetics of understatement. In the story "The House with a Mezzanine" a special artistic world is depicted, where people are like ghosts, shadows that have forgotten why they came, where there is a house, but no one lives in it, where they speak, but the words dissolve in the air, where love is possible, but it cannot be held. Chekhov writes not about how his characters "manifest" themselves in life, but rather about their absence, their unmanifestation in it.

The title of the story itself sets one up for reflection on the past, on something long gone, on a life that was once filled with colors, but now seems ghostly, disappearing. The main character of the story, an unnamed artist, "accidentally" ends up in an estate where a special mood reigns, creating an atmosphere of poetry and slight melancholy.

The path to the house runs through a alley, which forms a kind of time corridor, along which the artist first enters the unreal space of the estate, and in the end leaves it along the same road: "Then I turned into an avenue of limes. And here too were desolation and decay; the dead leaves rustled mournfully beneath my feet, and there were *lurking shadows* among the trees" (*Italics ours.* – E.I.) [3, p. 174]. The author creates an image of a space in which time slows down, life seems to flow away, and the shadows between the linden trees become an impressionistic metaphor for everything unrealized in the story.

The old, neglected estate, where everything quietly and slowly disappears, not collapsing, but simply dissolving in time, is a reflection of the mental state of the heroes, their passivity and unmanifestation in the present and the future.

The central image of the house is a full-fledged hero of the story. It preserves memories of the past, of something irretrievably lost: "the dear, simple, old house, which seemed to look at me with the windows of the mezzanine for eyes, and to understand everything" [3, p. 189]. It is a symbol of the old way of life, fading away along with the feeling of comfort and happiness. Its main architectural detail is the mezzanine – a small superstructure that gives the building a special, memorable silhouette. From an architectural point of view, this is not a full floor – no longer the first, but not the second either, not an attic and not a roof. It is not a real home, but a "half-floor", a kind of intermediate, borderline space between the residential and non-residential, between the real and the imaginary. It is this spatial uncertainty that makes it an expressive symbol of something inaccessible, unstable, something that exists, but cannot become part of reality until the end. He seems to float between dreams and reality.

I.V. Pyrkov notes that gradually this architectural detail comes to the fore, begins to be associated with something light, almost ephemeral, at the same time poetic and alive – with the image of Missyuss, woven from chiaroscuro and dreams.

It is then that it reveals itself as a symbol of an elevated, spiritual space, and the house itself seems to come to life, acquiring its own look and feelings: "The mezzanine, among other things, personifies not only height, including spiritual, but also the illusory, decorative nature of life" [2].

The figure of Zhenya Volchaninova, or Missyuss, is associated with this borderline image – a heroine who personifies the sophistication and beauty of the soul. She is modest, dreamy, sentimental, inclined to romance, leads an idle lifestyle. Perhaps this is one of the most "elusive" images in Russian literature. For the artist, Misyus is something incomprehensible, inaccessible. She lives "upstairs", in the mezzanine space not only physically but also metaphorically, that is, she is above the ordinary, outside the daily bustle, in the space of dreams. However, this elevated world remains inaccessible to the narrator. He never goes up to the mezzanine – just as he cannot truly get close to Missyuss.

The heroine is practically not revealed in the text. Chekhov depicts her in an impressionistic manner: fragile, almost ethereal, as if created from fog. Everything about her appearance exudes subtlety and vulnerability: "her pale face was, her thin nose, her arms, her slenderness" [3, p. 188]. Her image is quiet, almost ethereal, like the mezzanine itself, in which she lives. She loves nature, knows how to feel deeply, to see beauty where many do not notice it at all. That is why a subtle emotional connection arises between her and the artist, almost without words, because Zhenya is dreamy and silent, her words are rare, and her actions are barely noticeable.

Even the cute childhood nickname "Missyuss" is a sign that the heroine has never become an adult, real, visible. In essence, Zhenya is a weak-willed, spineless character, she does not have her own "I", does not know how to resist circumstances. Her image is almost a mirage, a reflection of something unrealized. Even the heroine's idleness is not a reproach for inactivity, but a quiet recognition of the inevitable course of history, a farewell to an image that is leaving forever, and a deep, warm love for a person who, perhaps, no longer has a place in the new reality. After all, Missyuss does not simply disappear – she is erased from the text, like an underdeveloped photograph. A paradoxical detail – a professionally observant artist is not able to reproduce the face of his beloved in his memory. Zhenya is not a real person for him, but an artistic image, so his memory captures not facial features, but impressionistic spots: pallor, a smile, movement - something that can be captured on canvas, but cannot be retained in life. She simply dissolves in the space of the text without any explanation, leaving behind only a question, just as the type of Turgenev's heroine of a bygone era dissolves in historical time.

No less interesting is the image of Lida Volchaninova, contrasted with the spiritual world of her sister and the hero-artist by her severity, conviction and active attitude to life. Two sisters, like two sides of the same coin. If Zhenya is

the personification of warmth, dreaminess and subtle sensitivity, then Lida is the embodiment of social activity, a rational approach and outwardly cold severity. Zhenya is the soul, Lida is the mind. If one contemplates, then the other acts. If one says “I want”, then the other says “I need”. If Zhenya is associated with the dreamy space of the mezzanine, then Lida argues about the zemstvo, about professional activity, studies with Dasha and receives patients downstairs, in the house.

However, the images of Lida and Zhenya in the story are connected not only by the principle of opposition, but also by a common feature - an incompletely realized essence, as if frozen on the threshold of the present. Upon closer examination, it becomes obvious that Lida’s activity is devoid of depth. It consists entirely of loudly declared principles and convictions, but behind them there is no sense of a living human personality. This is an example of another form of non-embodiment - activity without internal content. Lida is too down-to-earth, all her actions are aimed at the good of society – schools, pharmacies, meetings, but behind all this there is no sense of personal depth. She acts, guided solely by duty, and not by the dictates of the heart. Her feelings are hidden behind the facade of cold logic and principles, and remain a mystery to the reader.

The images of the sisters shade each other. It is through the contrast between them that Chekhov raises the question of what is more important: an active struggle for the “common good” or inner kindness and simple human participation, showing how difficult it is to choose between action and feeling, between inner depth and external activity. The writer, as always, deliberately does not give a clear answer as to which of them is right, because the truth is probably somewhere in the middle.

The Volchaninov sisters are an amazing pair of antipodes: Lida is an action without feeling, Zhenya is a feeling without action. Both of them live as if in the penumbra: the first - in the shadow of her convictions and principles, the second - in the shadow of her feelings and thoughts, and they represent equally unrealized possibilities.

This same “unrealization” is characteristic of the narrator himself, who only contemplates, but does not make a choice. This is a person with a subtle feeling, inclined to reflection and inner contemplation. His inner world can only be guessed by hints, looks, intonations. He is far from the bustle of the city, prefers peace and solitude, he perceives the world through beauty. He is attracted not by words, but by silence, not by deeds, but by sensations.

The protagonist lacks individuality in the usual sense: he has no name, no portrait, the author deliberately leaves his past outside the narrative. He is an eternal observer, a contemplator who lives in his inner world, is incapable of action, feelings are more important to him than actions, experiences, not changes. His position is the position of a person who is always “outside” real life. The artist is in a

state of mental confusion, he understands, feels, dreams, thinks, but does nothing. It's not that he doesn't want to act, but rather that he can't, doesn't find the strength in himself. And Chekhov does not condemn the hero, but on the contrary – he shows his vulnerability, fragility. Because it is in the unspoken, in the unfulfilled that the most real truth of life often lives – quiet, sad, but amazingly beautiful.

The image of the house with a mezzanine is also revealed through the hero's perception, which "became for the narrator not so much a real place as an internal category, a center of spiritual values, a symbol of pure, sublime love, fleeting happiness, broken hopes, a kind of utopian picture of life, expectations that will never come true, memories of one of the best moments of life" [1]. Like the mezzanine, the artist is on the border between reality and dream, between earth and sky, so he perceives it as a kind of personal sublime microcosm.

The love that arose between the characters is subtle, almost invisible, built on glances, hints, and omissions. It flared up and died out, never becoming a reality, never being embodied. Neither the artist nor Zhenya take a decisive step towards each other. The mezzanine window becomes a symbolic boundary that none of the characters dares to cross. Their closeness remains unsaid, unrealized to the end – unmanifested. Chekhov shows us love as a possibility that is never realized. It is no accident that the ending remains open: before us is not just an unfinished story, but a fundamental lack of embodiment as an artistic method. Architectural details, characters, plot lines – everything exists in a draft mode, intentionally left unsaid. In this story, what is more important is not what is said, but what remains behind the text – those very "shadows between the trees" that continue to excite the reader a century later.

List of bibliographic sources

1. Zherebtsova E. E. Symbolism and Axiology of the Artistic Space of A. P. Chekhov's Prose // Bulletin of ChelSU. 2000. No. 1. URL: https://cyberleninka.ru/article/n/simvolika-i-aksiologiya-hudozhestvennogo-prostranstva-prozy-a-p-chehova (date of access: 01.06.2025).

2. Pyrkov I. V. Forms of Communicative Links in A. P. Chekhov's Story "The House with a Mezzanine" // Philology: Scientific Research. 2017. No. 3. URL: https://cyberleninka.ru/article/n/formy-kommunikativnyh-zveniev-v-rasskaze-a-p-chehova-dom-s-mezoninom (date accessed: 01.06.2025).

3. Chekhov A.P. The House with the Mezzanine (A Painter's Story) / A.P. Chekhov // Chekhov A.P. Complete Works and Letters: In 30 volumes. Works: In 18 volumes. Vol. 9. [Stories. Novels], 1894–1897. – M.: Nauka, 1977. – P. 174–191.

DOI 10.34660/INF.2025.66.77.156

数字话语中的健康饮食：英语和俄语生活方式博客的语料库研究
HEALTHY EATING IN DIGITAL DISCOURSE: A CORPUS STUDY OF ENGLISH- AND RUSSIAN-LANGUAGE LIFESTYLE BLOGS

Borodina Julia
PhD Candidate
Belarusian State University

摘要：本研究运用语料库和计算语言学方法，分析女性用俄语和英语撰写的健康生活方式博客中与饮食相关的叙事。研究运用词频分析和内容分析等技术，识别并比较了围绕饮食选择的语言模式，包括诸如纯素食、素食者、无麸质、无乳制品、植物性、有机和生食主义等术语。先前的研究大多在单一的语言或文化语境中探讨这些概念，而本研究的突出之处在于，它提供了跨文化比较，探讨了饮食理念在英语和俄语网络健康话语中的语言建构和传播方式。通过考察语言使用情况，本研究旨在揭示与食物、健康和身体相关的文化根深蒂固的价值观、优先事项和意识形态。研究结果有助于更深入地理解数字健康叙事如何反映和再现不同文化背景下对健康和身份认同的更广泛的社会文化态度。

关键词：语料库语言学、语境分析、跨文化话语分析、数字通信、概念框架、健康叙事、健康生活方式。

Abstract. *This study employs corpus and computational linguistic methods to analyze diet-related narratives in healthy lifestyle blogs authored by women in Russian and English. Using techniques such as word frequency analysis and content analysis, the research identifies and compares the linguistic patterns surrounding dietary choices, including terminology such as vegan, vegetarian, gluten free, dairy free, plant based, organic, and raw foodism. While previous studies have explored these concepts within single linguistic or cultural contexts, this work stands out by offering a cross-cultural comparison of how dietary ideologies are linguistically constructed and communicated in anglophone and russophone online health discourses. By examining language use, the study seeks to uncover culturally embedded values, priorities, and ideologies related to food, health, and the body. The findings contribute to a deeper understanding of how digital health narratives reflect and reproduce broader sociocultural attitudes toward wellness and identity in different cultural settings.*

Keywords: *corpus linguistics, context analysis, cross-cultural discourse analysis, digital communication, conceptual framing, health narratives, healthy lifestyle.*

Introduction

In recent years, the rise of digital media has significantly transformed how individuals engage with health, wellness, and diet culture. Among the most prominent voices in this digital landscape are lifestyle bloggers, many of whom share personal experiences and advice related to food, nutrition, and wellbeing. These narratives not only influence consumer behavior but also contribute to broader discourses surrounding health, identity, and body politics. While much attention has been given to the sociocultural impact of diet trends and the commercialization of wellness, there remains a lack of systematic linguistic analysis of the language used to communicate these ideas, particularly in Russian-English cross-cultural context.

Methodology

The material for this study consists of a manually compiled corpus of posts from Russian-language (LikeLida, Live Up, Salatshop, Spoon, Tatyana Rybakova, WikiFit) and English-language (JSHealth, Mommypotamus, Betty Rocker, Fit Foodie Finds, Peanut Butter Fingers, The Healthy Maven) healthy lifestyle blogs. For each language, the corpus includes 6 blogs, with the 50 most recent posts (as of late 2018) from each blog.

This study employs frequency analysis of blog vocabulary to identify general patterns and significant differences in lexical choices between English- and Russian-language bloggers. While frequency analysis has its limitations—such as inability to distinguish between literal and figurative word meanings, as noted by M.L. Gasparov [1]—the application of corpus linguistics methods significantly expands the potential for discourse analysis in describing representations of linguocultural concepts [2]. Where quantitative data analysis fails to provide clear answers, we turn to contextual examination [3]. The comparative analysis considers both individual authors' thematic preferences and possible sociocultural differences in how the topic of a healthy lifestyle is represented by the Russian and English linguistic groups.

As members of the healthy lifestyle community, bloggers must account for the interests and trends of such community, as well as of their audience. For example, growing societal awareness of food choices has introduced terms like *vegetarian, vegan, gluten-free*, and *dairy-free* into bloggers' lexicons. Even if bloggers do not adhere to these dietary practices themselves, modern discourse demands inclusivity toward readers' preferences. The digital representation of healthy lifestyles and dietary habits has attracted attention from both Russian [2] and Western researchers [4, 5, 6].

The relevance of this study is determined by the insufficient research on how the *healthy eating* concept is linguistically represented in Russian and English discourse.

Results

By analyzing the linguistic material, we identified in English- and Russian-language blogs words from the lexico-semantic group "Types of Diets and Dietary Features" and tracked their frequency (see Tables 1a and 1b). In these tables, word frequencies are normalized per 1,000 words, with absolute counts provided in parentheses after each lemma. A "lemma" refers to the base form of a word representing its set of morphological variants [7]. For the Russian corpus, lemmas include derivational forms where applicable (e.g., the lemma *веган* encompasses all case/number forms and the adjective *веганский*).

Table 1a.

Frequency of certain Diet and nutrition terms in English-language blogs (normalized per 1,000 words)

Lemma	Betty Rocker	Fit Foodie Finds	JSHealth	Mommy-potamus	Peanut Butter Fingers	The Healthy Maven	Total word frequency:
vegetarian	0.091	0.064	0.000	0.000	0.067	0.132	**0.354**
vegan	0.000	0.405	0.602	0.000	0.134	0.462	**1.603**
gluten	0.844	0.405	0.417	0.179	0.022	0.627	**2.494**
dairy free	0.639	0.043	0.093	0.018	0.022	0.033	**0.847**
paleo	0.000	0.043	0.000	0.233	0.246	0.396	**0.917**
keto	0.000	0.021	0.000	0.000	0.000	0.000	**0.021**
carbohydrate	0.479	0.170	0.232	0.054	0.089	0.033	**1.057**
raw*	0.137	0.170	0.417	0.161	0.000	0.132	**1.018**
organic	0.114	0.234	0.649	0.502	0.134	3.595	**5.228**
plant-based	0.137	0.149	0.185	0.018	0.179	0.099	**0.767**
Total:	2.440	1.704	2.595	1.166	0.893	5.508	14.306

Table 1b.

Frequency of certain Diet and nutrition terms in Russian-language blogs (normalized per 1,000 words)

Lemma	Like-Lida	Live Up	Salat-shop	Spoon	Tanya Rybakova	WikiFitRu	Total word frequency:
веган	3.893	0.199	0.514	0.646	0	0	**5.252**
вегетарианец	0.105	0.517	0.270	0.431	0	0.062	**1.386**
глютен	1.683	0.080	0.324	0.517	0	0.062	**2.667**
безглютеновый	0.053	0.040	0.081	0.086	0	0	**0.260**
лактоза	0	0.040	0	0.474	0	0.749	**1.263**

безлактозный	0	0	0	0	0	0.062	**0.062**
сыроедение	0.947	0	0.487	0.043	0	0.125	**1.601**
палео	0	0	0	0	0	0.062	**0.062**
кето	0	0.517	0.027	0	0	0	**0.544**
углевод	0.053	0.876	0.189	0.129	0.562	4.058	**5.866**
гмо	0.053	0	0	0	0	0	**1.983**
органический	0.053	0.557	0.243	0.086	0	0	**0.939**
Всего	6.839	2.826	2.163	2.412	0.562	5.182	21.886

Several features of healthy eating narratives are similar across Russian and English blogs. For instance, the terms *vegan* (52)/*веган* (113) and *vegetarian* (14)/*вегетарианец* (36) (including derivatives like *веганский*, *вегетарианский* in Russian) appear in nearly all blogs in both languages, with *vegan* being more frequent than *vegetarian*. Contextual analysis clarifies this discrepancy: *vegan* often functions as an adjective describing recipes or products (e.g., *vegan quinoa salad, vegan protein powder, vegan chef; веганский майонез, веганское мороженое*), while *vegetarian* more commonly refers to people (e.g., *vegetarian options, vegetarian recipes, suitable for vegetarians; родители-вегетарианцы*). Additionally, the term *vegan* appeals to a broader audience, as all vegans are vegetarians, but not vice versa.

However, the analysis also revealed differences in approaches to healthy lifestyles, such as the diversification of diet types. For example, *dairy-free* (35) is widespread in English blogs, but its direct translation *безмолочный* is absent in Russian blogs, with only a single instance of the synonym *lactose-free* (1)/*безлактозный* (1).

The concept *plant-based* (29) (e.g., *plant-based milk, plant-based diet*) overlaps both with *vegan/vegetarian* and *dairy-free,* and translates into Russian as *растительный* (50), though their semantic ranges differ (*растительное масло ≠ plant-based oil*). Nonetheless, examples like *растительное молоко* (7) (alongside *кокосовое молоко* (39), *миндальное молоко* (11), etc.) suggest Russian audience is familiar with the concept of dairy-free diet.

Notably, the colloquial term *carb* in English blogs contrasts with the formal *углевод* in Russian. While *carb* is slang tied to low-carb diets (*low-carb diet*), *углевод* (110) carries a broader nutritional context (*полезные углеводы, быстрые углеводы, простые углеводы, нездоровые углеводы* etc.). For instance, the blog TanyaRybakova does not mention any other types of diet, focusing solely on macronutrient ratios (proteins, fats, carbs), which implies that *углеводы* may resonate more with general Russian audience unfamiliar with niche diet terminology.

The ketogenic diet (*keto* (1)/*кето* (14)) appears more frequently in Russian blogs, possibly due to its explanatory focus. For example, 13 out of 14 instances

of using word *кето* in Russian texts is found in a Live Up article titled "*Сало полезнее овсянки?!*", which features a dialogue with a specialist, *кето-коуч*. Conversely, the *paleo* diet (38) is far more common in English blogs, suggesting limited interest in Russian-speaking communities.

The term *сыроедение* (raw foodism) appears in three Russian blogs but is rare in English ones, where *raw* (36) typically denotes unprocessed foods (*raw honey, raw almonds raw chicken* etc.). The only exception is found in *The Healthy Maven,* which tags *raw* as a dietary preference, indicating raw foodism's niche status in anglophone discourse.

Finally, *organic* (173)/*органический* (26) is markedly more frequent in English blogs, a disparity explored further in the Discussion.

Discussion

The higher aggregate frequency of diet-related terms in Russian blogs invites further analysis. English blogs often use these terms in recipes to maximize inclusivity (e.g., "*Cinnamon Buns (Gluten Free, Dairy Free)*", "*Chocolate Chai Vegan Overnight Oats*", "*Jalapeño Cornbread Recipe (Gluten-Free, Primal)"*), reflecting societal normalization of diverse diets. We may typically see diet terms in collocation with the word *option* (e.g. *healthier option, dairy-free option, vegan option, grab-and-go option, low carb option*). In contrast, Russian blogs prioritize educational narratives, explaining trends (e.g., Live Up's article on keto) or advocating for health practices. For instance, 66 of 109 uses of *organic* in *The Healthy Maven* occur in an explanatory article ("*5 reasons to choose organic*"), mirroring Russian bloggers' didactic approach.

We may also see the similar high frequencies of *кето* (14) and *сыроедение* (38) in Russian blogs versus low frequencies of *keto* (1) and *raw foodism* (1) in English blogs, but it stems from different motivations. *Сыроедение* in Russian blogs is used in recipes (as a tag *подходит для сыроедов*, i.e. *suitable for raw eaters*), similar to how diet terms are used in English. In case of *raw foodism*, Russian bloggers respond to audience demand, while anglophone audiences appear to lack such interest.

Dietary preferences are not always explicitly marked (e.g., *low carb, vegetarian* or *dairy free*) but may be implied descriptively (*Bolognese zoodles, green smoothy bowl, eat healthily*), warranting further research.

Conclusion

This study examined the frequency of 10 key terms from the "Dietary Features" lexico-semantic group in Russian and English healthy lifestyle blogs. Challenges included identifying semantic equivalents across languages (e.g., *plant-based* vs. *растительный*). Key findings include:

- *Vegan* is more prevalent than *vegetarian* in both languages.

- Russian bloggers discuss *сыроедение* more often, while *paleo* is anglophone-centric.
- Diet-related terms are more frequent in Russian blogs, likely due to their explanatory tone.

Further research is needed to fully explain these trends.

References

1. Gasparov, M. L. The Artistic World of the Writer: Formal Thesaurus and Functional Thesaurus. In: Problems of Structural Linguistics 1984. Moscow: Nauka, 1988. pp. 125–137.

2. Kononova, I. V., Kulchitskaya, E. R. Modeling the Frame HEALTHY LIFESTYLE: A Corpus-Based Approach. Discourse. 2022 Sep 29; 8(4): 172–186.

3. Nefyodov, S. T., Chernyavskaya, V. E. Context in Linguistic Analysis: Pragmatic and Discourse-Analytical Perspectives. Bulletin of Tomsk State University. Philology. 2020. No. 63. URL: https://cyberleninka.ru/article/n/kontekst-v-lingvisticheskom-analize-pragmaticheskaya-i-diskursivno-analiticheskaya-perspektiva (accessed: 02.06.2025).

4. Cesiri, Daniela. "Positioning the self in blog posts. A corpus-based investigation of food blogs in English." Iperstoria 23 (2024): 244-260.

5. Genovez, Daniela Trocilo Tavares. You Are What You Eat: Modernity and the Construction of Self-Identity in Healthy Eating Discourses in a Case of Digital Media. MS thesis. Universidade de Evora (Portugal), 2008.

6. Mete, Rebecca, Jayne Curlewis, Alison Shield, Kristen Murray, Rachel Bacon, and Jane Kellett. "Reframing healthy food choices: a content analysis of Australian healthy eating blogs." BMC public health 19 (2019): 1-9.

7. Stubbs, Michael. Words and phrases: Corpus studies of lexical semantics. John Wiley & Sons, 2001.

DOI 10.34660/INF.2025.75.99.157

体育短语单位的交际语用取向（以职业足球为例）

COMMUNICATIVE-PRAGMATIC ORIENTATION OF SPORTS PHRASEOLOGICAL UNITS (ON THE EXAMPLE OF PROFESSIONAL FOOTBALL)

Davydova Svetlana Alexandrovna
Senior Lecturer
Kozak Ksenia Sergeevna
Student
Belarusian State University, Minsk, Republic of Belarus

注释。本文以职业足球词汇为例，探讨体育短语单位。文中列举了与职业足球相关的不同类别的短语单位，旨在探讨翻译的语用学层面。

关键词：足球，短语单位，体育话语，语用学，交际学。

Annotation. *The article is devoted to sports phraseological units using the examples of the vocabulary of professional football. Phraseological units from different categories related to professional football aimed at the pragmatic aspect of translation are given.*

Keywords: *Football, Phraseological units, Sport discourse, Pragmatics, Communication.*

Football, as one of the most popular sports in the world, shapes not only cultural and social connections but also enriches language, particularly sports vocabulary. Idioms reflect the dynamics of the game, the mentality of fans, players, and coaches. These expressions, going beyond their literal meaning, often convey emotional and cultural nuances that are difficult to express otherwise. Studying football idioms provides an opportunity to better understand how language influences sports culture.

Sports phraseological units are not just colorful turns of phrase, but the most important communication tool of the professional sports world. Their communicative and pragmatic focus is manifested in the ability to:

1. Efficiently encode professional experience and knowledge.
2. Form and strengthen corporate identity and spirit.
3. Regulate emotions in a high-stress environment.
4. Carry out tactical communication with the outside world (media, fans).

5. Create dramaturgy and involve the audience.

6. Legitimize the status of a professional.

Understanding these functions allows us to penetrate deeper not only into the linguistic features of sports discourse, but also into the very essence of professional sports culture, where language becomes an extension of tactics, psychology and struggle - both on and off the field. Phraseological units are "players" in the field of communication, performing their clear pragmatic tasks.

Football discourse is a unique form of communication that encompasses not only sporting aspects but also cultural, social, and emotional elements. Key characteristics of football discourse are the following:

1. Specific vocabulary. The use of terms related to the game, rules, and tactics. For example, the phrase '*get the ball rolling'* literally is translated as 'дать мячу катиться'. In everyday life this expression means to start doing something. It can be considered an equivalent of the Russian phrase 'сдвинуться с мертвой точки'.

2. Emotional intensity. A high degree of emotional expression is tied to victories and defeats. '*Big Game Player'* – this is how British people refer to a player who spends most of the season underperforming but suddenly steps up and scores a decisive goal in a crucial moment. English commentators have used this term for players like Zlatan Ibrahimović and Bastian Schweinsteiger.

3. Communicative purpose. This purpose is to convey information, create a competitive atmosphere, and engage the audience. '*Get your head in the game'* means to focus and fully concentrate on a task or situation. This expression originates from sports, where athletes must be mentally engaged and be attentive during a game or competition. When someone tells you to 'get your head in the game,' they are urging you to stay present and direct your attention and energy toward completing the task at hand.

During the research we divided phraseological units into 5 categories connected with football. The first category is the category of gameplay tactics and it comprises 19 expressions. For example, '*to take the bus'*, which in Russian means 'парковать автобус', implies that a team switches to a completely defensive strategy with little intention to attack. The phrase was coined by José Mourinho when he was coaching Chelsea, accusing Tottenham of 'parking the bus' in front of their goal. *To stay on feet*, or 'оставаться на ногах', is a phrase directed at players, urging them not to dive or prematurely tackle an opponent. This became an internet sensation when Ray Wilkins repeatedly used it while commentating on the 2011 Champions League match between Real Madrid and Tottenham.

The second category includes category of *team and players and* has also 19 expressions. An example from this category is the idiom '*foot like a traction engine'*. When someone says a player has a foot like a traction engine, they mean the player has a powerful strike. The phrase comes from the British satirical TV

show **The Day Today**. Steve Coogan's character, Alan Partridge, a parody of a sports reporter, commented during a match: "*Blimey! Did you see that? He must have a foot like a traction engine!" [1].*

The third category, *playing style*, counts out 22 expressions. For instance, the phrase '*heavy metal football'*, in Russian 'футбол в стиле хэви-метал', describes a playing style invented by German football coach Jürgen Klopp. This style is characterized by high intensity and speed, featuring rapid counterattacks. The term gained popularity when Klopp was coaching Borussia Dortmund.

The *attributes* category includes 9 expressions, such as '*back of the net' for example*, which means a goal. The phrase is attributed to Alan Partridge, a TV character played by comedian Steve Coogan in the 1990s. Partridge, however, used it in a non-football context: "*My girlfriend's thirty-three. I'm forty-seven. She's fourteen years younger than me. Back of the net" [1].*

The final category, *proper names*, has only 2 expressions. One example is *Cruyff Turn*. The Cruyff Turn is the name of a dribbling technique popularized by Dutch player Johan Cruyff when he used it to bypass Swedish defender Jan Olsson during the 1974 World Cup. The move involves faking a pass and then dragging the ball behind the standing leg with a 180-degree turn.

Football idioms reflect sporting realities and social phenomena. This demonstrates how sports influence language, creating new meanings and associations. For example, '*to level the playing field'* means to create a fair and equal situation where everyone has the same opportunities to succeed. The expression originated in sports, where officials work to ensure all teams have equal chances to win by eliminating unfair advantages. In a broader context, leveling the playing field means removing barriers, biases, or inequalities that might give certain individuals or groups an unfair advantage. The goal is to create conditions where everyone has a fair chance to succeed based on their skills and abilities. Thus, this expression is used not only in football but also in other contexts.

Idioms are divided into phraseological fusions (idioms) (*hairdryer treatment* – 'головомойка от тренера"), phraseological unities where the meaning cannot be understood literally. For example, *box seat* for a theatergoer means 'a seat in the box.' In English football slang, however, it is used exclusively by experts when one team leads by a score of 2-0 or more. There are also phraseological combinations where meanings can be understood literally. Football is often called the beautiful game, so *anti-football* refers to a team's style of play that is cynical, defensive, and, in some cases, brutal. This term is believed to have been first used to describe the playing style of the Argentine club Estudiantes during the 1968 Intercontinental Cup final against Manchester United. Commenting on the 2010 World Cup final between the Netherlands and Spain, Johan Cruyff said: *"This ugly, vulgar, hard, hermetic, hardly eye-catching, hardly football style, yes it served the*

Dutch to unsettle Spain. If with this they got satisfaction, fine, but they ended up losing. They were playing anti-football" [1].

Football idioms play a key role in creating an emotional backdrop and evaluative stance in sports media. They are used for:

1) Creating a competitive atmosphere: *barnstorming finish* in America, originally a noun meaning 'barnstorming tour.' It was understood literally: touring performers would stage shows in barns. Later, the term was adopted by pilots. In aviation, it came to refer to stunt flights for entertainment, featuring loops, barrel rolls, etc. In English football, however, it describes the thrilling end of a match when one team manages to turn the game around at the last moment.

2) Expressing evaluative attitudes: *bottling team* is used to accuse a team of squandering a game from a winning position.

3) Capturing the audience's attention: the phrase heavy metal football, mentioned earlier.

4) Creating a comedic effect: especially in satirical or entertainment contexts. The English often mention Hollywood falseness. There's the Hollywood smile - white-toothed but fake - and the *Hollywood pass*, a beautiful, long-range pass that is ultimately aimless.

Phraseological units serve several important functions in communication:

- **Expressive function**: They allow speakers to convey emotions, feelings, and evaluations more vividly and figuratively. They add emotional coloring to speech and enhance its impact on the listener. *Batten Down The Hatches* – 'prepare for trouble' (expresses alarm).
- **Evaluative function**: They often contain an evaluative component, expressing positive or negative attitudes toward a subject, phenomenon, or situation. *A political football* – 'политический футбол' (negative evaluation of a situation).
- **Pragmatic function**: They are used to achieve specific communicative goals, such as persuasion, softening, emphasis, irony, etc. They help manage the listener's attention and reaction. *To blow the whistle on someone* – 'to expose someone' (goal is to draw attention).
- **Nominative function**: They are used to denote objects, phenomena, or situations that lack direct lexical representation. They allow complex concepts to be expressed concisely. *Fox in the box* – 'poacher' (briefly describes a striker).
- **Stylistic function**: They add a specific stylistic tone (colloquial, formal, humorous, etc.) to speech. They are used to create stylistic effects and align with a particular genre or register of communication. *Funny Old Game* – 'strange game' (in a colloquial style).
- **Characterizing function**: They can be used to describe a person's qualities, behavior, or social status. *YouTube footballer* – 'a player who plays for media fame' (characterizes behavior).

By semantics:

Sports metaphors: *To blow the whistle on someone* means to expose illegal activities and the people responsible for organizing them. Here, the meaning is transferred from football to other spheres.

Evaluative expressions: *All to play for* is mainly used before a match where something important is at stake, typically between evenly matched teams, or during a match that is currently tied, so any attack could be decisive. This expression highlights the drama of the situation.

By degree of expressiveness:

Highly expressive: *Back of the net* that was mentioned before.

Low expressiveness: *To know the score*, meaning to be informed.

Thus, it can be said that phraseology, as a linguistic discipline, is an important tool for understanding language phenomena related to fixed expressions. In the context of football, phraseological units are not only used for enriching language but also reflect the cultural, social, and emotional aspects of sports discourse. Football discourse, as a source of phraseological expressions, is characterized by specific vocabulary, high emotional intensity, and purposeful communication. Classifying phraseological units by structure, semantics, and degree of expressiveness allows for a deeper understanding of their functional features and role in language. The semantic peculiarities of football idioms highlight the connection between language and extralinguistic reality, demonstrating how sports realities are reflected in language and influence everyday communication. Idioms used in sports media play a key role in shaping the emotional backdrop, evaluative attitudes toward events and participants, and capturing the audience's attention. They become an essential means of expressing opinions and feelings, making them indispensable in sports communication. Moreover, football idioms can create a comedic effect and add humor to discussions about sports events, making them versatile and widely applicable in various types of discourse.

In conclusion, phraseological units related to football not only develop any language but also serve as an important tool for understanding cultural and social phenomena associated with sports. Their study allows for a deeper awareness of how language shapes our perception of the world and adapts to changing societal conditions and demands. The most diverse thematic category was gameplay, while the least diverse was proper names.

References

1. Football News, Live Scores, Results & Transfers [Electronic resource] // Football phrases: 101 slang terms, idioms and meanings explained. Mode of access: https://www.goal.com/en/news/football-phrases-101-slang-terms-idioms-meanings-explained/lpfi6xqrxtmc1gjoi1e7hc7un (date of access: 15.04.2025).

2. Wall Street English [Electronic resource] // Идиомы про футбол на английском языке. Mode of access: https://www.wallstreetenglish.ru/blog/idiomy-pro-futbol-na-angliyskom-yazyke/ (date of access: 15.04.2025).

DOI 10.34660/INF.2025.48.24.158

科学理性动力学中的知识理论
THEORY OF KNOWLEDGE IN THE DYNAMICS OF SCIENTIFIC RATIONALITY

Borsiakov Yuri Ivanovich
Doctor of Philosophy, Professor
Nikishin Sergey Vyacheslavovich
Candidate of Philosophical Sciences, Associate Professor
Voronezh State Pedagogical University

注释：本文作者指出，科学新知识的涌现是一个复杂的多阶段过程，既包括系统性研究，也包括意外发现。它不仅需要积累新的事实，也需要对现有理论、方法和理解世界的方式进行修正。这种方法有助于深入理解科学进步的机制和评估科学成就的标准。这种方法使科学得以发展，并不断丰富新知识，从而促进人类知识的进步。

关键词：科学、理性、知识、主体、意义、传统、研究纲领。

Annotation. *In the article, the authors show that the emergence of new knowledge in science is a complex, multi-stage process that includes both systematic research and unexpected discoveries. It requires not only the accumulation of new facts, but also a revision of existing theories, methods, and approaches to understanding the world. This approach allows for a deep understanding of the mechanisms of scientific progress and the criteria for assessing scientific achievements. This approach allows science to develop and be enriched with new knowledge, contributing to the progress of human knowledge.*

Keywords: *science, rationality, knowledge, subject, meaning, tradition, research program.*

The specificity of the emergence of scientific knowledge is that scientific knowledge, in the form of a theory, hypothesis, idea, cannot arise from established knowledge, but it is not completely deducible from it. Is it possible in this case to rationally understand the connection between scientific concepts and theories that arise at different points in historical time? How to understand scientific rationality: to recognize it only as a measure of objectivity of reality reflected in the content of a scientific theory, or to recognize it as the result of a transcendental synthesis of various definitions carried out by the subject of knowledge. In other words, to

understand the phenomenon of scientific rationality as something independent of the subject of knowledge, or, on the contrary, directly constructed by it. Therefore, it is logical to pose the problem of the emergence of scientific knowledge as a problem of change or emergence of types of rationality. According to this point of view, the rationality of scientific knowledge is nothing more than the degree of its correspondence as a subjective image with an objective prototype; the rationality of knowledge coincides here with truth and logic.

In this regard, V.S. Stepin suggests distinguishing two more types of rationality in addition to classical rationality: non-classical and post-non-classical. All these types differ in the degree of implementation of reflection on the system of connections between the object of cognition and the operational activity of the subject comprehending it, the specifics of the tools and means of this activity, as well as on the interaction of intra-scientific and external - value-target structures of activity - in the process of scientific creativity. Thus, if in the classical type of scientific rationality, in order to achieve objectively true knowledge about the world, a necessary condition is the elimination from scientific theory of everything that is connected with the subject of cognition, then in the post-non-classical type of scientific rationality it changes: the most complete explication of these connections is required. However, "... the emergence of each new type of rationality did not reject the previous one," Stepin notes, "but only limited its scope, determining its applicability only to certain types of problems and tasks" [1, p. 632-633]. And then the question arises about the reasons and conditions for the transition from one type of rationality in scientific knowledge to another.

Stepin believes that one of these reasons is the creation of a scientific picture of the world, which occurs as a result of ideological changes in culture. The development of individual areas of the scientific picture of the world – special scientific pictures of the world – also has a significant impact on the formation of ontological components of ideological ideas in culture. Philosophy plays a special role in such relations between science and culture. It serves as a link in the processes of collision and conjugation of scientific and general cultural meanings. And although this function has been carried out by philosophy since the emergence of theory as such, it only achieves factual evidence for theoretical thinking itself with the beginning of the formation of post-non-classical rationality.

Since rationality varies according to the scheme: classical – nonclassical – post-nonclassical, it becomes necessary to understand whether this division into such types is absolute or only relative, that is, is it only a classification of certain rationalities or a division within a single rationality? Understanding this also depends on understanding how and in what way it is necessary to comprehend the emergence of scientific knowledge with a change in the type of rationality.

A characteristic feature of modern philosophical works devoted to the problem of rationality is the tendency to list the basic meanings of this concept [2, p. 18].

K. Hübner distinguishes four types of rationality: logical, empirical, operational and normative. According to Hübner, "rationality always appears in the same form, namely semantically as an identical recording of rules of a certain semantic content, empirically as the application of always identical rules of explanation, logically – operationally as the application of calculation, normatively as the reduction of goals and norms to other goals and norms. Rationality, therefore, is something formal. It relates only to the assigned content, for example, to the content of science or the content of myth" [3, p. 35]. G. Lenk in the article "Types and Semantics of Rationality" lists twenty-one meanings of the term "rationality" [4, pp. 20-22].

However, is the idea of the diversity of rational forms an achievement of only modern philosophy? Are there no features of the relativity of reason in classical philosophy? It would seem that confirmation of such an assumption can be found already in German classical philosophy: "German idealism," writes Gaidenko, "especially in the person of Hegel, proposed to consider the subject of knowledge historically: Kant's ahistorical transcendental subject appeared as the history of developing humanity. As a result, the previously rigid dichotomy of scientific and unscientific, false and true knowledge was removed; the concept of the relatively true, true for its time, appeared; truth… acquired a new definition for it, became historical." [2, p. 11]. Nevertheless, the claim made by Hegelian philosophy to consider truth in its actual development was not fulfilled. Knowledge in Hegel does not acquire a truly historical status, since the historical itself is thought of by him as a moment of the logical, as its other being. Therefore, any typology of Ratio in the Hegelian system turns out to be inevitably conditional and abstract, quasi-historical, since "the truth of the world consists, according to Hegel, only in its ideality, and not in the fact that it has true reality..." [5, p. 249].

Idealizations of the cognitive subject do not mean that we are always talking about an individual researcher, "…creating… a new theory. This may also be a collective subject" [6, p. 272-273] of "cognition" [7, p. 15-16]. In fact, the situation is as follows: a historical moment in the development of scientific knowledge may seem indefinite if the theoretical scheme itself, to which it is "attracted", is not simultaneously "attracted" to some historical content. At the same time, this logical situation presupposes two directly opposite directions of its development: the continuation of its aggravation, firstly, either in the direction of further emphasizing and radicalizing the moments of incompatibility of various initial idealizations of scientific theories, or, secondly, in the direction of recognizing the connection between such idealizations as additional, that is, also taking into account the logical gap between these idealizations that cannot be bridged by purely deductive methodology.

But in such a direction, as is easy to notice, the problem of the emergence of new knowledge does not even arise; only another direction turns out to be method-

ologically productive, in which the noted logical gap of idealizations as the foundations of various scientific theories receives, although relative, but at the same time, substantial filling through the analysis of the specific nature of the complementary connections of these idealizations. And only with such an approach to the indicated situation does the possibility of interpreting scientific knowledge as "new" appear through attributing its belonging to various types of rationality.

Otherwise, "the exit from a methodology devoid of history into a history devoid of internal logic is," as N. S. Avtonomova correctly notes, "an exit into that external "metaphysical" context that makes the rational irrational, relativizes and devalues it" [8, p. 62]. "Meaning (as a thought about the external or internal world of man) acquires," as A. S. Kravets writes, "an independent form of "self-movement": it can develop toward generalization, i.e., generalize to the highest limits, surprising us with its "lifeless" scientific abstractions, but it can change in the opposite direction, enrich itself in breadth, become more specific." [9, p. 66]. But: "…one cannot fetishize meaning, ascribing to it independent activity and turning it into a self-sufficient entity. At the head of meaning is always the thinking person, the true and only demiurge of meaning" [9, p. 66].

The complexity of the schematization, or a kind of decomposition into a spectrum of types, of the rationality of scientific knowledge, conditioned by the heterogeneity of human subjectivity necessary for the emergence of new scientific meanings, consists in showing the specificity of each concrete type in its self-givenness, without resorting to any rationality in general, as if given alongside it, or external to it, that is, to show the logical irreducibility of each individual type to such abstract rationality. The unconditional existence of a separate and indivisible type of rationality into abstract universality thus requires proof of the conventionality of the existence of a rationality of scientific knowledge that is divisible by each of such types and thereby quasi-complementary to them. However, this requirement is complicated to the point of almost complete impracticability when identifying this integrity with the spontaneity of the processes of socio-cultural determinations of scientific knowledge, when it is impossible to distinguish the conscious subjective attitudes of the scientist's scientific search from his unconscious conformism with the group interests of the scientific community or broader social communities.

The fallacy of such identification occurs due to the substitution of the thesis about the social conditioning of scientific knowledge with the thesis about its socio-cultural determination, which results from the confusion of the broad and narrow interpretation of the concept of "social" itself. They proceed either from a narrow understanding of the role of social foundations in the genesis of scientific knowledge, when their participation is considered only as rational elements, or from a broad interpretation of the social conditioning of scientific knowledge,

which does not draw an impassable boundary between rational knowledge and its deviant forms. Each of the approaches is valuable in its own way, however, if a narrow interpretation of social inclusions in scientific knowledge, useful only when interpreting their negative role in it, is substituted for a broad interpretation, then it will also be necessary to deny the existence of connections between the conceptualization of specific types of human social existence and the concepts of fundamental theories and principles contemporary to these types, clearly traced by a number of authors.

As P. P. Gaidenko shows, one of the cases of such a connection is revealed in the analysis of the sources of the formation of some provisions of classical mechanics. Thus, the discovery of the principle of inertia took place in direct interaction with the generalizations of the legal and political theory of the 17th century, which was based on the principle of self-preservation, most consistently explicated in the philosophical systems of T. Hobbes and B. Spinoza.

A somewhat different form of "human influence" on the "non-human" impersonal law of science is considered by T. B. Romanovskaya using the example of M. Planck's substantiation of the principle of conservation of energy. When Planck, guided in the development of scientific theory by the desire for its classical completeness and finality, takes as the starting point for the deduction of the principle of conservation of energy "... the experimental law expressing the impossibility of perpetuum mobile and its inversion" [10, p. 45], then here "... the very appeal to this law fulfills, according to Romanovskaya, the task of additional substantiation, confirmation of an equally substantiated law, but no longer in an impersonal language, but in the language of the "human world", and no special attention was paid to this circumstance" [11, p. 45]. In fact, both the principle of conservation of energy and the principle of impossibility of a perpetual motion machine have only empirical verification, however, the second is used as the basis for deductive justification of the first, although the statement that constitutes its essence about "…the impossibility of creating a "perpetual motion machine", does not actually speak about human participation in its creation, but rather… gives an example of a specific formulation: there is no perpetual motion machine in nature" [11, p. 45]. Consequently, it is not so much the fundamental impossibility of creation that is considered, as the functioning of a perpetual motion machine (for which human participation is not required at all). It turns out that the law of conservation of energy is formulated as a prohibition principle limiting the possibilities of human activity. Due to which, Planck's own ideas that the law of conservation of energy "…should be considered more general than the mechanistic picture" [11, p. 45] also seem, in Romanovskaya's opinion, to be quite justified.

A. N. Krichevets takes a different position when he attempts a critical reading of the well-known formula for the process of objectification-de-objectification of

the ideal (including scientific knowledge) in human cultural activity according to E. V. Ilyenkov: "thing – deed – word – deed – thing" [12, p. 219-227] because this formula does not allow us to answer the question: "where does the new ideal arise?" [13, p. 161] "In short," notes Krichevets, "it is impossible to localize a new thought anywhere, and its content cannot be predicted from any position. How did the natural science of the New Age arise? Where did the ideal contents that were later recorded in mathematical texts and the mathematical scientific tradition first originate? This question is one of those that cannot be resolved in principle. It cannot be said that natural science was "invented" by Galileo and Descartes. It was born through them, but none of them fully understood the process that took place thanks to each and no one individually" [13, pp. 161-162]. The same subject material, Krichevets believes, can serve to extract different ideal entities from it due to the incompatibility of the initial cognitive attitudes of the subjects. According to Krichevets, it is precisely this kind of divergence of attitudes that is, for example, the case when Gödel, having become acquainted with the program of finite justification of Hilbert's mathematics, was able to form, in contrast to the author himself and his colleagues, a different, critical vision of it - proof of its impracticability.

The emergence of new knowledge in science is a complex, multi-stage process that includes both systematic research and unexpected discoveries. It requires not only the accumulation of new facts, but also a revision of existing theories, methods, and approaches to understanding the world. In this regard, the model of the famous scientific methodologist I. Lakatos is noteworthy, which represents a comprehensive approach to understanding the development of science, where scientific theories develop not in isolation, but within the framework of holistic research programs. This approach allows for a deeper understanding of the mechanisms of scientific progress and the criteria for assessing scientific achievements. It is important to note that Lakatos emphasized the retrospective nature of assessing the development of scientific programs, which makes his model especially valuable for the historical analysis of scientific knowledge. This approach allows science to develop and be enriched with new knowledge, contributing to the progress of human knowledge.

References

1. Stepin V. S. Theoretical knowledge / V.S. Stepin - M.: "Progress - Tradition", 2000. - P. 743.

2. Gaidenko P. P. Scientific rationality and philosophical reason / P. P. Gaidenko - M.: "Progress - Tradition", 2003. - P. 528.

3. Hübner K. Wie irrational sind Mythen und Götter? / Duerr HP (Hg). Der Wissenschaftler und das Irrationale. – 2 Bde. – Frankfurt a. M., 1981. – Bd. 1. – S. 35.

4. Lenk H. Typen und Systematik der Rationalität. – In: Zur Kritik der Wissenschaftlichen Rationalität, hrsg. Von H. Lenk, – Freiburg – München, 1986. – S. 579.

5. Hegel G. V. F. Works of different years: In 2 volumes. – / G. V. Hegel M.: Mysl, 1971. –V. 2.– P. 668.

6. Lektorsky V. A. Subject, object, knowledge. /V.A. Lektorsky – M.: Nauka, 1980. – P. 358.

7. Stepin V. S. Self-developing systems and post-non-classical rationality /V.S. Stepin// Questions of Philosophy. – 2003. – No. 8. – P. 15 – 16.

8. Avtonomova N. S. Reason, intelligence, rationality. / N. S. Avtonomova – M.: Nauka, 1988. – P. 288.

9. Kravets A. S. Values and meanings /A.S. Kravets// Bulletin of Voronezh. state. University. Series 1, Humanities. – 2007. – No. 1. – P. 66.

10. Planck M. The principle of conservation of energy. – M. – L., 1934. – P. 138. – Quoted from: Romanovskaya T. B. Objectivity of science and human subjectivity, or what is the human dimension of science. – M.: Editorial URSS, 2001. – P. 45.

11. Romanovskaya T. B. Objectivity of science and human subjectivity, or what is the human dimension of science / T. B. Romanovskaya - M.: Editorial URSS, 2001. P. 208

12. Ilyenkov E. V. Ideal /E.V. Ilyenkov/ Philosophical Encyclopedia: In 5 volumes. – M.: Soviet Encyclopedia, 1962. – V. 2. – P. 219 – 227;

13. Krichevets A. N. Transcendental subject and diversity of cognitive attitudes /A. N. Krichevets / Mathematics and experience. - M.: Moscow State University Publishing House, 2003. - P. 624.

DOI 10.34660/INF.2025.15.40.159

亚瑟•叔本华古典德国哲学思想的生理机制解释
PHYSIOLOGICAL MECHANISMS OF EXPLANATION OF THE IDEAS OF CLASSICAL GERMAN PHILOSOPHY OF ARTHUR SCHOPENHAUER

Ananiev Vladimir Nikolaevich
Doctor of Medical Sciences, Full Professor, Leading Research Worker
Institute of Biomedical Problems of the Russian Academy of Sciences, Moscow, Russia
ORCID ID: 0000-0002-4679-6441

Torshin Vladimir Ivanovich
Doctor of Biological Sciences, Professor
Peoples' Friendship University of Russia, Moscow, Russia
ORCID ID: 0000-0002-3950-8296

Prokopyev Nikolai Yakovlevich
Doctor of Medical Sciences, Full Professor
Tyumen State University, Tyumen, Russia
ORCID ID: 0000-0002-9525-0576

Ananieva Olga Vasilievna
Doctor of Medical Sciences, Full Professor
Tyumen State Medical University, Tyumen, Russia
ORCID ID: 0000-0002-0672-9164

Ananiev Georgy Vladimirovich
Doctor, Medical Representative
JSC "PHARMSTANDART", Moscow, Russia
ORCID ID: 0009-0005-4287-8430

Gurtovoy Elisey Sergeevich
Student
Tyumen State Medical University, Tyumen, Russia

摘要。摘要。在亚瑟•叔本华的哲学概念"作为意志和表象的世界"中，主体所感知的世界被视为其心理活动的结果，具体而言是认知过程和意志行为。与客观现实不同，物质世界并不具有独立的本体论地位，而是大脑认知活动的产物，大脑

对环境进行解释并形成主观意象。叔本华引入“意志”这一范畴，作为人类行为的基本动机原则，并通过“欲望”、“奋斗”和“想要”等现象体现出来。在这位哲学家看来，意志是决定人类存在方向和意向性的首要驱动力。

另一方面，在阿列克谢•乌赫托姆斯基的生理学理论框架内，“主导”的概念是指神经系统的一种主导状态，其特征是稳定地专注于实现某一目标。支配力可以以多种形式表现出来，例如食物、性支配力、自我保护反射，以及人类的目标反射。

通过比较叔本华的哲学观点与乌赫托姆斯基的生理学概念，我们提出了一个假设，即叔本华的意志可能被解读为与乌赫托姆斯基的支配力概念相关的生理现象。

为了支持这一假设，我们可以引用以下观察结果：在深度催眠状态下，支配态度和暗示意象会对受试者的意识产生显著影响，从而决定其行为反应和目标。催眠导致受试者沉浸在一个虚幻的世界中，这与叔本华的哲学概念相呼应，即感知世界是意志和表象的结果。

因此，本文提出的解读叔本华哲学著作的方法有助于更深入地理解他的哲学遗产，并为运用生理学和认知科学的方法研究叔本华的哲学遗产开辟新的前景。

关键词：学生，医学催眠，主导，叔本华，乌赫托姆斯基。

Abstract. *Abstract. In Arthur Schopenhauer's philosophical concept "The World as Will and Representation", perceived by the subject, is considered as a result of his mental activity, in particular, cognitive processes and volitional acts. Unlike objective reality, the material world does not have an independent ontological status, but is a product of the cognitive activity of the brain, which interprets the environment and forms subjective images. Schopenhauer introduces the category of "will" as a fundamental motivational principle of human behavior, manifested through such phenomena as "desire", "striving" and "wanting". Will, according to the philosopher, is the primary driving force that determines the direction and intentionality of human existence.*

On the other hand, within the framework of the physiological theory of Alexei Ukhtomsky, the concept of "dominant" is a dominant state of the nervous system, characterized by a stable focus on achieving a certain goal. Dominance can manifest itself in various forms, such as food, sexual dominance, self-preservation reflexes or the goal reflex in the case of humans.

Based on a comparison of Schopenhauer's philosophical views and Ukhtomsky's physiological concepts, we put forward a hypothesis about the possible interpretation of Schopenhauer's will as a physiological phenomenon associated with Ukhtomsky's concept of dominance.

In support of this hypothesis, we can cite the observation that in a state of deep hypnosis, dominant attitudes and suggested images have a significant impact on the subject's consciousness, determining his behavioral reactions and goals. Hypnosis leads to the subject's immersion in an illusory world, which corresponds to Schopenhauer's philosophical concept of perceiving the world as a result of will and representation.

Thus, the proposed approach to interpreting Schopenhauer's philosophical works contributes to a deeper understanding of his philosophical heritage and opens up new prospects for its study using the methods of physiology and cognitive sciences.

Keywords: *students, medical hypnosis, dominant, Schopenhauer, Ukhtomsky.*

Introduction. Arthur Schopenhauer (1788-1860), an outstanding philosopher of the 19th century, introduced the concept of "will" as a fundamental concept of his philosophical system [11, 12]. This term denotes the basic force that permeates all aspects of being and serves as the basis for such concepts as "desire", "striving", "urge" and "effort" [1]. In his philosophy, Schopenhauer postulates that all nature, including human existence, is a manifestation of an insatiable will. It is through this essential force, which, in his opinion, determines the nature of all living things, that man experiences all his suffering. Suffering, according to Schopenhauer, arises as a result of an insatiable desire to satisfy desires, which inevitably leads to disappointment and dissatisfaction [12].

Schopenhauer develops the idea that the world perceived by man is a world of objects localized in space and time, connected by cause-and-effect relationships. This world exists exclusively as a phenomenon dependent on the cognizing subject, and cannot be considered independent of the subject's perception. Thus, knowledge of external objects is always knowledge of phenomena, and not of things in themselves [10, 11, 12].

Schopenhauer defines the "thing in itself" (Ding an sich) as the inner essence of all living things, which represents the will: a blind, unconscious and aimless striving, devoid of knowledge, located beyond space and time and free from any multiplicity. In his concept, the world as a representation is the "objectification" of the will, that is, the external manifestation of this inner force [12].

Exploring the secrets of reason, I. Kant came to the conclusion that all our ideas about the world are possible only in the categories of space and time. The key question of the Critique of Pure Reason is the study of the cognitive capacity of reason. It only remained to understand what exactly space and time are. Are they purely objective realities or a figment of the human imagination [4].

According to Schopenhauer, the will is the "inner essence" of the whole world, the Kantian thing in itself, and exists independently of the forms of the principle

The concept of the dominant was formulated by A.A. Ukhtomsky in 1904 [9]. The dominant is a set of certain symptoms that manifest themselves in various systems of the body, including muscular, secretory and vascular. It is not localized in one part of the central nervous system, but is a constellation of centers with increased excitability in various parts of the brain and spinal cord, as well as in the autonomic nervous system. The dominant is an active state of the brain aimed at

achieving a goal. The main property of the dominant is the possession of efferent pathways (especially important are motor executive pathways). After satisfaction, the dominant significantly loses its strength or disappears, and another dominant takes its place. Ukhtomsky believed [9] that all aspects of human experience, including scientific knowledge, are influenced by dominants that determine the choice of impressions, images and beliefs. The formation of a dominant occurs on the basis of impulses from receptors, information from memory, activation of unconditioned reflexes and hormonal mechanisms, which is carried out through ascending impulses of neurons from the periphery to the central nervous system.

A dominant is an active state of the nervous, muscular, hormonal and other systems aimed at achieving a certain goal. After achieving the goal, the dominant loses its relevance, giving way to a new dominant. The key property of a dominant is the possession of efferent systems, among which the muscular system dominates, ensuring the implementation of purposeful actions.

A dominant is stable and is strengthened under the influence of afferent signals, competing with other dominants for access to efferent pathways. According to the research of I.P. Pavlova [5], the change of dominants is a complex and energy-consuming process that can lead to disruption of the central nervous system.

Purposeful behavior of animals and humans is possible only in the presence of appropriate motivation, which is formed on the basis of needs, such as the sexual reflex, the self-preservation reflex, the food reflex and the goal reflex in humans. The absence of motivation makes it impossible to implement the appropriate behavior. For example, it is impossible to develop a conditioned digestive reflex in a well-fed animal, since there is no hunger motivation [5, 9].

Schopenhauer's ideas also contribute to modern psychiatry [13, 14], combining materialistic (neurobiological) and idealistic (subjective) concepts of mental disorders and raising awareness of the methods of psychiatric research.

Schopenhauer's concept of will [15] contains the foundations of what became Freud's concepts of the unconscious and the id. Schopenhauer's works contain aspects of what later became Freud's theory of free association.

To form goal-directed behavior, it is necessary to excite certain nerve centers while simultaneously suppressing the activity of other centers. Thus, motivation must be dominant to ensure the implementation of goal-directed action or behavior.

Research objective. To analyze the works of A. Schopenhauer from the point of view of Academician A.A. Ukhtomsky's teaching on the dominant, using the model of maximum dominant in the form of medical hypnosis.

Research materials and methods. To solve the tasks, volunteers from the medical faculty were introduced into a deep stage of medical hypnosis [1, 2, 6] using a safe method in which their will, their desires were determined by the sug-

gestion of the hypnotist. In our studies, the formation of the dominant (own will, desires were replaced by suggested images of the hypnotist) was carried out by the hypnotist, who suggested a visual hallucination, for example, said that the students were in the garden [1]. The students began to pick apples, eat them, tell what they see in the garden, walk. Therefore, we believe that the hypnosis model for studying the dominant (like will in Schopenhauer) is a sufficiently reliable and irreplaceable scientific method and has reliable clarity. To analyze the dominant of A.A. Ukhtomsky [9] and the teachings of A. Schopenhauer [11, 12], their publications were used.

Results of the study and their discussion. In a hypnotic state, a dominant attitude can be formed, in which the subject, despite maintaining the physiological activity of the sense organs, perceives and interprets sensory information in accordance with the suggested attitudes. This leads to the creation of a subjective reality that fully corresponds to the suggested images. This phenomenon of the dominant [9] demonstrates the possibility of volitional formation of a subjective idea of the external world, which is consistent with Arthur Schopenhauer's philosophical concept of the world as will and idea. Where Schopenhauer [11, 12] believed that it is impossible to know the surrounding world, which is a fantasy created by the work of the brain, the willpower of a person, his desires, aspirations (dominant according to Ukhtomsky). On this basis, we assume that the study of hypnotic states can serve as a methodological basis for modeling and analyzing the principles of Schopenhauer's philosophy. This assumption was implemented in our scientific research.

The strongest dominant can be formed in hypnosis, when after suggestion a person, even with open eyes, sees and hears what the hypnotist suggested (this is the dominant), the person is immersed in a virtual world of illusions. A person, with his will (desire, goal), creates a fantastic image of the surrounding world, which can correspond to Arthur Schopenhauer's teaching about the world as will and representation [12]. Therefore, we believe that the study of hypnosis can model the principles of Schopenhauer's teaching, which we applied in our scientific work.

For example, if a student has two strong desires (two dominants) in the morning - to go to school and go on a date, then how do we know which dominant is the main one? It is clear that we will determine the main dominant in a student by muscle activity, we will see where he goes. The main dominant will seize control of the muscle motor executive pathways and will begin to satisfy himself, for example, a student will go on a date, which means that this dominant is the main or first one in the student. Thus, we can identify the main dominant by muscle activity and the final useful action of a person [1, 9].

The struggle of dominants among themselves for implementation (possession of motor pathways) is the most difficult and costly process for the brain, as Academician I.P. Pavlov wrote [5]. In some cases, the struggle of dominants leads to a breakdown of higher nervous activity, neurasthenia (Pavlov I.P.).

In our studies, in deep hypnosis, students were told that they were 5 years old, they began to play with cars, crawl on the floor, answer that they were 5 years old, call their mother. Even with their eyes open, students in hypnosis saw objects suggested by the hypnotist, for example, the suggestion is you are in a garden and everyone in hypnosis sees a garden, apples, a lake, etc. This means that in hypnosis we create the strongest dominant, the dominant captures all motor pathways (all efferent pathways), blocks all information from receptors and instead of a real visual image creates a virtual hallucinogenic visual suggested image from memory. Only hypnosis allows a person to quickly create a certain dominant and study its properties and influence on the overall activity of the body and the work of various receptors [1, 3, 7, 8]. In hypnosis (Fig. 1) we conducted a study of the dominant in students, it turned out that the suggestion, for example, that they were in Africa, elephants were walking around, bananas were growing, monkeys were running, the students walked and talked with their eyes open about elephants and other animals, and they were happy, which means that the students did not notice that the dominant was introduced from the outside by the hypnotist, and, although their free will was absent, the students considered this state to be normal for them.

Figure 1. *Professor Ananyev V.N. - carries out suggestion in hypnosis*

Therefore, we concluded that it is the will of a person that includes different dominants and makes them the main ones, and hypnotic suggestion uses the mechanism of the brain, which stands above the will of a person. Hence the danger of introducing subconscious information into the brain through uncontrolled viewing of television, computer games and other types of destructive information input.

In our studies, we immersed subjects in a deep phase of medical hypnosis, which allowed them to open their eyes, but they saw only themselves in the suggested virtual reality. For example, in Fig. 1, the students were suggested that they were husband and wife, the students hugged, although they hardly knew each other.

Figure 2. *Professor V.I. Torshin makes a suggestion in hypnosis*

The subjects talked, answered questions, ran. It is noteworthy that in hypnosis the subjects did not collide, they walked up and down the stairs, which allows us to assume that the brain analyzes the surrounding environment, although in hypnosis the students said that they were in the garden, eating and picking apples, etc. Other students in hypnosis hold virtual guitars, play them, and say that they see themselves on stage in front of the audience of a concert hall. Fig. 2 shows a photo where Professor V.I. Torshin in hypnosis conducts a survey of students on the physiology program. He noted that in hypnosis the students answered various top-

ics with sufficient arguments. Further, V.I. Torshin made a suggestion to the students in hypnosis that studying and reading physiology would bring them pleasure (a survey of students months later showed that studying physiology brings them positive emotions).

Conclusion. Future doctors, students clearly saw the methods of introduction to deep safe medical hypnosis. Students saw the methods of various hypnotic suggestions, which they can later use in their medical practice to treat various diseases and to control the mental state of patients. Therefore, the study of the mechanisms of hypnosis is relevant, has both a practical medical nature and is a fundamental problem of modern medicine, especially normal physiology. This allowed us to link classical German philosophy in the works of A. Schopenhauer "The World as Will and Representation" with classical Russian physiology based on the doctrine of the dominant of Academician A.A. Ukhtomsky in our study.

Literature

1. Ananyev V.N., Torshin V.I. Analysis of the mechanisms of hypnosis from the standpoint of the doctrine of the dominant of Academician Ukhtomsky // Natural and technical sciences. 2020. – No. 9 (147). – P. 69-72.

2. Bekhterev V.M. Hypnosis. Suggestion. Telepathy. – M .: Mysl, 1994. – 364 p.

3. Bul P.I. Hypnosis in the clinic of internal diseases (experience of psychotherapy - hypnosis and suggestion in the clinic). – M .: Medicine, 1967. – 239 p.

4. Kant I. Critique of Pure Reason. – M.: Academichesky Proekt, 2020. – 567 p. (Philosophical Technologies. Classical German Philosophy). ISBN 978 5 8291 3545-4

5. Pavlov I.P. Twenty-year experience in studying the higher nervous activity of animals. – Publisher: "Nauka" 1973. – 652 p.

6. Platonov K.I. Word as a physiological and therapeutic factor. – Moscow: Medgiz, 1962, – 532 p.

7. Rozhnov V.E. Handbook of Psychotherapy. – M.: Medicine, 1985. – 719 p.

8. Slobodjanik A.P. Psychiatry, suggestion, hypnosis. – Kyiv: Zdorov'ya, 1982. – 373 p.

9. Ukhtomsky A.A. Dominant. Articles from different years. 1887-1939. - SPb: Piter, 2002. – 448 p. SBN 5-318-00067-3.

10. Chepeleva N.Yu. Theory of ideas in Schopenhauer // Philosophical journal. – 2021. – Vol. 14, – No. 2. – P. 95-110. – DOI 10.21146/2072-0726-2021-14-2-95-110.

11. Schopenhauer Arthur. The world as will and representation. Thoughts. Aphorisms of everyday wisdom. – SPb: Azbuka-Atticus, 2021. – 864 p. (ISBN: 978-5-389-20312-9 / 9785389203129).

12. Schopenhauer Arthur. The World as Will and Representation. Volume 1. – M. Academic Project. 2017. – 567 p. (ISBN: 978-5-8291-1844-0 / 9785829118440)

13. Daub J., Brandt G.A., Volkmer S., Northoff G., Hirjak D. Schizophr Res. Arthur Schopenhauer: An underappreciated philosopher in psychiatry and his applied epistemology of body and self-experience. 2024 – May; 267: 487-496. doi: 10.1016/j.schres. 2024.04.019.

14. Johnson B, Brand D, Zimmerman E, Kirsch M. Drive, instinct, reflex-Applications to treatment of anxiety, depressive and addictive disorders. //Front Psychol. 2022. – Sep 26; 13: 870415. doi: 10.3389/fpsyg.2022.870415.

15. Young C, Brook A. Schopenhauer and Freud. //Int J Psychoanal. 1994 Feb; 75 (Pt 1):101-18.PMID: 8005756

DOI 10.34660/INF.2025.50.51.160

车臣人传统婚礼文化中的弄臣——朱哈尔格形象（基于实地调研材料）
THE IMAGE OF THE JESTER — ZHUKHARG IN THE TRADITIONAL WEDDING CULTURE OF CHECHENS (BASED ON FIELD RESEARCH MATERIALS)

Shavlaeva Tamara Magamedovna
Doctor of Historical Sciences, Chief Researcher
Institute of Humanitarian Studies of the Academy of Sciences of the Chechen Republic

注释：本文探讨了车臣人婚礼文化中的弄臣——朱哈格（zhukharg）形象。作者旨在描述这一形象，阐明其功能并追溯其演变。同时，本文运用了民族学和民族志学中常用的研究方法，例如田野调查、历史重构、比较分析等。作者得出结论：在民间文化传承者的本土环境中，弄臣——朱哈格形象的复兴是可能的。

关键词：车臣人，传统社会，婚礼仪式，弄臣——朱哈格的形象，形象的演变。

Annotation. *This article examines the image of the jester - zhukharg in the wedding culture of the Chechens. The author's goal is to describe this image, show its functions and trace its evolution. At the same time, research methods accepted in ethnology and ethnography are used, such as collecting field material, historical reconstruction, comparative analysis, etc. The author comes to the conclusion that the revival of the image of the jester-zhukharg is currently possible in the native environment of the bearers of folk culture.*

Keywords: *Chechens, traditional society, wedding rituals, the character of the fool-zhukharg, the evolution of the image.*

All known nations of the world hold entertainment events, including the most popular of them, accompanied by dancing - weddings. The Caucasian nations are no exception in this matter, including the Chechens, for whom the fun takes place on a very emotional level. A wedding among the Chechens is called "lovzar", which in Russian means "game", "festivity", "fun". There is no doubt that the traditions of festivities go back to the pagan era, and over time they have undergone changes. In traditional society, a wedding was fun for the entire settlement, everyone who wanted to came there without an invitation. Weddings were usually held outdoors, in a spacious place, both during the day and in the evening / at night, and not indoors, unlike another entertainment event - sinkeram - less significant.

Famous Caucasian experts M. M. Kovalevsky [1], B. K. Dalgat, [2] V. N. Akimov [3], F. I. Leontovich [4] and others touched on topics related to the wedding culture of the peoples of the Caucasus, including the Chechens

Weddings were held on the occasion of particularly important events, but the most striking of them were weddings on the occasion of the marriage of the newlyweds, therefore researchers Z. I. Khasbulatova [5], S.-M. A. Khasiev [6], Z. H.-A. Bersanova [7], A. M. Isaeva [8] paid attention to it in the system of family rituals of the Chechens. In particular, the ethnologist Z. H.-A. Bersanova writes: "In the system of family rituals, the most spectacular and complex in its structure is the wedding ceremony. It has preserved features that arose at various stages of the historical development of society" [7]. The culturologist A. M. Isaeva notes that the traditional wedding ceremony of the Chechens is an important part of their ethnic culture and establishes the social status of new families who have gathered to become related [8, p. 24].

This article, written on the basis of the author's field materials, examines the image of the clown-zhukharg, which is singled out as an independent research topic from the general wedding culture of the Chechens. Linguist A. Vagapov cites the etymology of the lexeme and believes that it originally had a meaning close to the Balkarian dzhugur "motley, pockmarked", Digor dzughur, Kalm. цооxр "motley, striped, spotted, pockmarked, dappled". Hence the motivating meaning for the clown - "disguised, dressed in motley clothes" [9, p. 132]. The analogue of this image in Russian culture is considered to be a clown, a buffoon, a mummer.

Mummers are recorded in the ritual culture of all the peoples of the Caucasus. In particular, the famous ethnographer of Dagestan R. I. Seferbekov testifies that an important place in the ritual culture of the peoples of Dagestan was occupied by mummers, who took part in most calendar, agricultural, family and public holidays and rituals [10, p. 9].

The mummers performed different functions, and if we single out the function of the mummer in the wedding culture, for example, among the Chechens, then the entertainment function comes first. According to field research, our incomparable character tried in every way to attract attention to himself and amuse the audience. To achieve this goal, they dressed, first of all, in bizarre costumes. The mummer's costume occupies a special place in his image. The central element of the costume is a mask made of felt or dried lamb/calf skin, repeating the shape of the head or face. In place of the eyes, nose and mouth, slits were made, which were outlined with paint, soot or ocher. The zhukharg carefully masked his face and hands, and also did not speak, not wanting to be recognized. It was forbidden to tear off the mask from the jester's face, and if this happened, the culprit was removed from the wedding. The audience welcomed when they played along with the zhukharg in every possible way, bringing some variety to his work. The zhukharg wore an

old, torn fur coat that was buttoned incorrectly from the inside out, with one sleeve shorter than the other or missing altogether. Bright rags were attached to the coat, and various objects that made a ringing sound were hung on a wide belt, including fangs, bones, a knife, a rope, a scraper, a wolf's tail, etc. There was a belief that if a girl was touched with a wolf's tail, she would fall madly in love with him. Shoes were worn in different sizes and on different feet, and one shoe had no sole. Trousers were multi-colored and torn in places. The jester could be anyone with a playful character, regardless of gender and age, but in most cases, they were men. If the zhukharg was a woman, she could hug the girl and put her head on her lap, which caused general delight and was a clue to the jester's gender. The jester's job was to make the audience laugh, making up various skits on the fly. He ridiculed the "shortcomings" of those present, imitated the dancers, copying their dance in a negative light, hung accusations, plotted, for example, he whispered false information to a girl about her beloved, who was present right there. For the sake of the audience's laughter, the zhukharg could allow himself an obscene, but quite acceptable, prank. Of course, he was sometimes "punished" for such actions. In such cases, the "angry" zhukharg would dig a grave-shaped hole right on the site where the wedding was taking place, put a bone taken from his belt in it, pour water on it, and then, having covered it with earth, "put up" a stick-monument, thus informing that he killed and buried his offenders. The most popular staging was the one where the zhukharg, posing as a handsome man, a brave horseman and the best dancer, deceived the guy during a dance to "beat off" the girl he was courting. At the time when the guy, having performed a circular motion, moved away from the girl to dance an element of the dance in front of the seated horsemen, taking advantage of the moment, the zhukharg took the girl away. Fearing his touch, she submitted and left, but was in great confusion. The insulted groom staged a scene of "punishment" of the zhukharg, but among those present there was always a bad person who stood up for the zhukharg, and together they defeated the guy. Then the boy would send a messenger for his best friend, and at that very moment his friend would come to his aid on a "steed" (a stick with an imitation of a horse's head) and they would defeat the juharg and his supporter. The boy and the happy girl would continue the dance. We have described only one staging, but there were many of them, made up as they went along, and in each village, they were supplemented with local color [11. PMA].

As we noted above, the wedding, lovzar, is a very early phenomenon. The presence of other theatrical elements at the wedding, along with the jester, dates back to ancient times, where both the original traditions and innovations were reflected.

As field information shows, over time the wedding underwent changes, although its rational core was always preserved, and at the same time a transforma-

tion took place in the image of the zhukharg. By the end of the 19th - beginning of the 20th century, culture of the wedding ceremony acquired a classical character, which was manifested in strict rules, the establishment of a special order at the event with the allocation of responsible persons. Also, some elements left the wedding culture, which was associated with the religious factor and historical setting. The image of the jester was stably preserved in the Chechen wedding culture, but a comparative analysis shows that the behavior of the zhukharg became more restrained: if in early examples the zhukharg is very active, tries to entertain the public in every way, playing out meaningful theatrical scenes, then in later versions the zhukharg is not so critical and mischievous. It seems that against the background of the classical status of the wedding, where horsemen and girls in strict Caucasian costumes, impeccable discipline reigns, not allowing walking, shouting, the zhukharg more protects this system from the evil eye.

The image of the jester - zhukharg was present in Chechen wedding ceremonies until the 60s of the 20th century, then it gradually disappeared into oblivion. In the last 15-20 years, within the framework of the Program for the Revival of the Spiritual Values of the Chechen People, they have tried to introduce the character of zhukharg at official weddings or other entertainment events, but it does not make any noticeable impression, because the actors playing it lack nationality, the character is placed in the wrong nature and remains unsolved in essence [11. PMA].

Thus, we tried to give a brief description of the image of the jester - zhukharg in the wedding culture of the Chechens. We traced its entertaining function and evolution to the present day. In our opinion, the character of zhukharg should be revived, first of all, in his native folk environment, he should appear at a folk wedding in the villages of the republic, where everyone who wants to is present, and not just those invited according to a pre-compiled list. At weddings, which have recently been played in restaurants, this character is not in his element, therefore he has no visible effect.

References

1. Kovalevsky M. M. Law and Custom in the Caucasus M, 1890 T 1-2.

2. Dalgat B.K. Tribal life and customary law of the Chechens and Ingush: research and materials from 1892-1894. Moscow: IMLI RAS, 2008. - 380 p.

3. Akimov V.N. Wedding customs and ceremonies of the Chechens and Ingush // SME 1881. Issue III.

4. Leontovich F. I. Customs of the Caucasian highlanders Materials on the customary law of the Northern and Eastern Caucasus Odessa, 1882-1883 Issue 1-2.

5. Khasbulatova 3 I. Family rituals of Chechens and Ingush in the late 19th - early 20th centuries // Family and everyday rituals of the Vainakhs Grozny, 1982.

6. Khasiev S.-M. A. The Institute of Courtship of Chechens (based on materials from the second half of the 19th – early 20th centuries) // Family and Everyday Rituals of the Vainakhs. Grozny, 1982.

7. Bersanova Z. H.-A. Traditional wedding ceremony of the Chechens.https:// anchr.ru/2020/01/tradicionnyj-svadebnyj-obryad-chechencev/ Date of access 20.05.2025

8. Isaeva A.M. Traditional wedding ceremony of the Chechens: historical-cultural analysis // News of universities. North Caucasian region. Social sciences. 2023. No. 1. P. 24–29.

9. Vagapov A.D. Etymological dictionary of the Chechen language. - Tbilisi: Meridiani, 2011. - 733 p.

10. Seferbekov R. I. Pantheon of pagan deities of the peoples of Dagestan (typology, characteristics, personifications) Abstract of dissertation for the degree of Doctor of Historical Sciences. Makhachkala, 2009. P. 9.

11. Author's field materials (AFM).

DOI 10.34660/INF.2025.38.45.161
17.00.04
UDC: 75.047

文学和绘画中的贝加尔湖保护区

PROTECTED AREAS OF LAKE BAIKAL IN LITERATURE AND PAINTING

Gorbonos Olga Konstantinovna
Postgraduate student
Novosibirsk State University of Architecture,
Design and Arts named after A.D. Kryachkov,
Novosibirsk, Russia
ORCID ID: 0000-0002-3881-0290

摘要：本文介绍了贝加尔湖风景如画的著名自然景观，这些景观在当地民族的艺术史诗中被描述，并由风景画家在其作品中呈现。这些景观包括位于此的奥尔洪岛和萨满卡岩石。这些自然景观深受艺术家、游客和所有自然爱好者的喜爱。本文分析了以下画作：练习曲M. I.杜宾斯基的《萨满卡岩石》（1940年），现藏于国家预算文化机构“V. P.苏卡切夫伊尔库茨克地区艺术博物馆”；V. S.罗加尔的《论奥尔洪岛。贝加尔湖》（1968年），现藏于联邦国家预算文化机构“国家历史博物馆”；V. G.斯马金的《贝加尔湖。奥尔洪岛》（1983年），现藏于地区国家自治文化机构“托木斯克地区艺术博物馆”。这部艺术史诗以贝加尔湖——一个充满童话的湖泊——的形式呈现，并汇集于一本印刷出版物中。

关键词：贝加尔湖、奥尔洪岛、萨满卡岩、艺术史诗、风景画家、保护区。

Abstract. *The article describes the most famous picturesque natural places of Lake Baikal, described in the artistic epic of local peoples and presented by landscape artists in their works. Such places include Olkhon Island and Shamanka Rock, located here. These natural objects are very popular with artists, tourists and all nature lovers. The article analyzes the following paintings: etude M. I. Dubinsky's "Shamanka Rock", 1940, is housed in the State Budgetary Cultural Institution "V. P. Sukachev Irkutsk Regional Art Museum"; V. S. Rogal's "On Olkhon. Baikal", 1968, is housed in the Federal State Budgetary Cultural Institution "State Historical Museum"; V. G. Smagin's "Baikal. Olkhon", 1983, is housed in the Regional State Autonomous Cultural Institution "Tomsk Regional Art Museum". The artistic epic is presented in the form of Lake Baikal, a lake of fairy tales, collected together in one printed publication.*

Keywords: *Lake Baikal, Olkhon Island, Shamanka Rock, artistic epic, landscape artists, protected areas.*

Unique natural places, such as Lake Baikal, fascinate and attract the attention of artists, poets, writers, as well as all people interested in the history and nature of their native land. Inspired by the beauty and harmony of this place, painters create their beautiful landscapes filled with air and light. And poets and writers verbally try to convey to the reader a living image of nature, which is an obligatory attribute in preserving the moral values of humanity. That is why this study of landscape works by artists, together with literary reproduction, is relevant and does not lose its significance despite the age of new digital technologies and interactive technical paradigms.

The purpose of this article is to examine landscape works by artists: M. I. DuBinsky "Shamanka Rock"1940; V. S. Rogal "On Olkhon. Baikal", 1968; V. G. Smagina "Baikal. Olkhon", 1983, depicting the protected areas of Lake Baikal in the context of the presented "Baikal - the lake of fairy tales".

To achieve the stated goal of the following tasks, need to be solved:

– present scientific and specialized sources of literature related to the current research topic;

– outline the methodology of this study;

– present the characteristics of the protected areas of Lake Baikal: Olkhon Island and Shamanka Rock, based on "Baikal - Lake Fairy Tales";

- in the context of the presented artistic epic, consider the landscape works of artists M. I. DuBinsky "Shamanka Rock"1940; V. S. Rogal "On Olkhon. Baikal", 1968; V. G. Smagina "Baikal. Olkhon", 1983

The results obtained as a result of the conducted research can be used in further pedagogical and scientific activities in the study of landscape painting of specific regions.

The practical significance of this study lies in the application of the findings in further analysis of paintings by specific artists.

For a more in-depth and comprehensive study of this issue, a special study was made scientific literature, which can be divided into several groups:

The first group of publications is devoted directly to the fine arts of the Baikal region and in particular to the landscape genre of painting, and includes: article Gomboeva M. I. "Contemporary Buryat art" [2]; work of an art critic Lareva T. G. "History of fine art of the Baikal region of the 20th – early 21st centuries" [3]; article by candidate of cultural studies, associate professor of the department of cultural studies and art history Manzyreva E.S. "The Image of Eastern Siberia and its Reflection in Regional Artistic Culture" [5]; scientific publication Ozhegina M. O. "Comparative and contrastive analysis of landscape painting of Transbaikalia and Altai" [6].

The second group of works is dedicated to the creative destinies of artists from Transbaikalia, and includes: scientific article Lyashenko E. S. "The Passing Away

and the Current: Axiology of Symbols in the Paintings of the Artist I. V. Bukhogolova" [4]; publication Pokatsky V.A. "Artistic creativity of S. Vronsky in the 60-70s of the XIX century" [7].

The third group consists of scientific articles devoted to general issues of landscape painting, such as: scientific work Syromyatnikova E. V. "Methods of conveying the light and air environment in landscape painting" [8] and the publication of Tkachenko O. S. "History of the landscape genre: the problem of terminology" [9].

The collection of "Baikal-Lake Tales" (volume 1) cited in the article performs descriptive and illustrative functions [1].

The presented sources of literature allow us to consider more thoroughly the issues of landscape painting and to reveal the theme of this work. "Protected places of Lake Baikal in literature and painting" in full.

The methodology of this study includes:

-general scientific methods, which include: a method of description, giving a general characteristic of the object or phenomenon under study. Specifically, in this work, these are landscape views of certain artists, presented in their canvases, Olkhon Island and Shamanka Rock; further, these are the methods of induction (from the particular to the general) and deduction (from the general to the particular), when, examining a specific landscape, one can find something common, characteristic of all landscape painting, and, conversely, examining landscape painting as a whole, approach the works of specific artists of a certain region;

– also, the studied special and scientific literature presented in this work can also be considered as a methodology guiding the vectors of this study.

The protected natural areas in this article are Olkhon Island and the lake located on it. -Shamanka rock.

Olkhon is the largest island on Lake Baikal, its territory is protected by ecologists. The name of the island has its roots in ancient Buryat legends, associated with the forest and hills that are abundant on the island. The landscape of the island is very diverse, rare Siberian herbs and shrubs grow on it. Olkhon is also distinguished by the presence of sand along the coastline. Olkhon's climate was formed under the influence of Lake Baikal.

Shamanka Rock is the "calling card" of Baikal, this region is recognized by its image. This is a sacred place for the Buryats who inhabit this territory. It was on Shamanka that shamanic rituals were held and sacrifices were made to the gods since ancient times. The rock consists of different types of stones and limestone. That is why it has such an unusual, memorable color-light. There is a shaman's cave under the top of the cliff. According to ancient legends, it was here that the master of Olkhon lived. In addition to the master himself, the spirits of the lake - the terrible winds - also lived here. There are places of worship for spirits all

over the island, where locals and visitors bring offerings and knit colored ribbons. Currently, Olkhon is the main sanctuary of Buryat shamans.

These natural objects are reflected in folk epics:

"The Master of Olkhon

There is a scary cave on Olkhon Island. It is called Shamanskaya. And it is scary because the ruler of the Mongols, Gegen-Burkhan, brother of Erlen-Khan, the ruler of the underworld, once lived there. Both brothers terrified the inhabitants of the island with their cruelty. Even the shamans were afraid of them, especially Gegen-Burkhan himself. Many innocent people suffered from him. And at the same time and on the same island, on Mount Izhimey, there lived a wise hermit, Khan-guta-babai. He did not recognize the authority of Gegen-Burkhan, and did not want to know him, and never went down to his domain. Many had the chance to see how he lit a fire at night on the top of the mountain and roasted a ram for dinner, but there was no way there - the mountain was considered impregnable. The formidable master of Olkhon tried to subjugate the sage-hermit, but he gave in: no matter how many warriors he sent there, the mountain would not let anyone in. Anyone who dared to climb the mountain fell dead, because huge stones crashed down on the heads of the uninvited guests with a roar. So, everyone left Khan-guta-babai alone. It so happened that Gegen-Burkhan executed the husband of one islander, a young herder, because he looked at him disrespectfully. The young woman fell to the ground in grief, burst into bitter tears, and then, inflamed with fierce hatred for Gegen-Burkhan, began to think about how to rid her native tribe of the cruel ruler. And she decided to go to the mountains and tell Khan-Guta-Babai about the severe suffering of the islanders. Let him intercede for them and punish Gegen-Burkhan. The young widow set out on her journey. And surprisingly, where the most agile warriors failed, she climbed easily and freely. So, she safely reached the top of Mount Izhimei, and not a single stone fell on her head. Having listened to the brave, freedom-loving islander, Khan-guta-babai said to her:

- Okay, I will help you and your tribe. And you go back and warn all the islanders about this. The delighted woman came down from Mount Izhimei and did what the wise hermit had told her to do. And Khan-guta-babai himself, on one of the moonlit nights, landed on the land of Olkhon on a light, white-foamed cloud. He pressed his ear to the ground and heard the groans of the innocent victims killed by Gegen-Burkhan.

- It is true that the land of Olkhon is soaked in the blood of the unfortunate! - Khan-guta-babai was indignant. Gegen-Burkhan will not be on the island. But you must help me with this. Let a handful of Olkhon soil be painted red when I need it! And in the morning, he went to the Shaman's Cave. The angry ruler came out to the sage-hermit and asked him hostilely:

- Why did you come to me?? Khan-guta-babai calmly answered:

-I want you to leave the island. Gegen-Burkhan became even more angry:

- This will not happen! I am the master here! And I will deal with you!

- I'm not afraid of you, - said Khan-guta-babai. He looked around and added: - There is power against you too!

I looked around and Gegen-Burkhan gasped: nearby stood a dense wall of frowning islanders.

- So, you want to settle the matter by battle! – cried Gegen-Burkhan.

- I didn't say that, - Khan-guta-babai said calmly again. - Why spill blood? Let's fight instead, it will be peaceful!

- Come on! Gegen-Burkhan and Khan-Guta-Babay fought for a long time, but no one could gain the upper hand - both turned out to be real heroes, equal in strength. And so they parted. They agreed to settle the matter the next day by drawing lots. They agreed that each would take a cup, fill it with earth, and before going to bed, each would put his cup at his feet. And whoever's earth turned red during the night would leave the island and migrate to another place, and whoever's earth did not change color would remain in possession of the island.

The next evening, as agreed, they sat side by side on the felt placed in the Shaman's Cave, placed a wooden cup filled with earth at their feet, and went to bed.

Night fell, and with it came the insidious underground shadows. Erlen Khan, on whose help his cruel brother had strongly hoped. The shadows noticed that the earth in Gegen Burkhan's cup had turned red. They immediately carried the cup to Gegen Burkhan's feet. But the blood of the slain proved stronger than the shadows of Erlen Khan, and when a bright ray of the morning sun burst into the cave, the earth in Khan Guta Babai's cup went out, and the earth in Gegen Burkhan's cup turned red. And at that moment they both woke up.

Looked at his cup Gegen-Burkhan sighed heavily:

"Well then, you will own the island," he said to Khan-guta-babai, "and I will have to migrate to another place."

And then he gave orders to his Mongols to load the camels with their belongings and dismantle the yurts. In the evening Gegen-Burkhan ordered everyone to go to bed. And at night, the Mongols, caught by the powerful shadows of Erlen-Khan, with their camels and all their belongings were quickly carried beyond Lake Baikal. In the morning they woke up on the other shore.

But many poor Mongols remained to live on the island. From them came Olkhon Buryats, who inhabit this island today"[1, 59].

For comparative analysis, this work presents paintings by landscape artists from the Baikal region. "Scenery– a genre of fine art in which the main subject of the image is nature, as well as the natural environment transformed by man" [9, 456].

Let us consider the landscape by M. I. Dubinsky “Shamanka Rock”, sketch, 1940:

The composition of the work has a rectangular position, close to a square. The rock is located in the background, if you look at it in perspective. However, it occupies a central place in the work, almost in the center. The artist depicted the surface of Lake Baikal a little lower, where the stone sculpture is located. The background is presented as the other bank with rocks protruding into the water. The entire work is done in a fairly light color scheme. Blue and beige shades predominate, which give the entire landscape lightness, airiness and transparency. “The colors fade with distance and acquire a bluish tint. Thus, all the variety of colors is softened and covered with a bluish-blue color of the distant plans” [8, 177]. The rock has ledges, uneven stones, which emphasize and highlight its individuality and natural origin. The painting depicts a clear summer day. The water in a small bay is very calm without waves. The entire work exudes peace and tranquility. Harmony in the surrounding world-harmony in the soul [2]. The presented work has the characteristics of the realism style, as: all objects and subjects in the work correspond to their physical sizes; linear perspective divides the landscape into three planes.

Landscape by V. S. Rogal “On Olkhon. Baikal”, 1968 continues the theme stated in the previous work. The composition has a horizontal position. A bright sunny day is also shown. From the cliff described above, the viewer moves virtually along the shore into the depths of Olkhon Island. The work depicts the shore of the island, receding into the distance to gentle hills. The water surface is depicted calmly, without waves. At the very horizon, it smoothly turns into the surface of the sky. The sky is clear blue with rare white clouds [3]. The sandy shore of Baikal is deserted, but the viewer sees that there are people here, since there are wooden boats on the shore and a house is located not far from them. Further, a strip of wild grasses and wild flowers is shown in bright dark green. Everything is blooming and smelling on the island under the bright summer sun. Similar to the previous work, the depicted landscape has signs of the realism style, since all objects and objects have real physical sizes and volumes, are located in space according to the laws and conditions of perspective. “…, the essence of which is to reduce the size of objects as they move away: we depict objects close by as large, and in the distance– small” [8, 176]. The overall mood of the work is just as serene and peaceful.

And the artist’s work completes the study. V. G. Smagina”Baikal. Olkhon”, 1983. Despite the name, the painting is undoubtedly dedicated to the Shamanka rock, which occupies almost the entire horizontal surface of the painting. The rock is presented in all its glory, with two tops depicted. The artist shows the creation of nature as if from above. The work is more contrasting than the first with the image

of the same rock [4]. Here, the Shamanka is painted in very gentle blue, gray and beige tones. And it is opposed by the deep blue of the water surface of Lake Baikal, which once again emphasizes its beauty and uniqueness. This work has signs of the symbolism style, since the rock and the entire landscape are painted with very large, broad strokes, schematically, without details. Two elements are shown: stone and water, their opposition to each other and interaction [7].

Analyzing the presented works, it can be stated that when artists use the styles of realism and symbolism, it is possible to show the uniqueness and inimitability of the protected areas of Lake Baikal.

Therefore, having examined all the presented works of the artists M. I. Dubinsky, V. S. Rogal, V. G. Smagin, we can draw the following conclusions:

– all the artists' works are done in the genre of natural landscape;

– all the artists' works depict protected areas of Lake Baikal: Olkhon Island and Shamanka Rock;

- works of artists M. I. Dubinsky and V. S. Rogal have signs of the realism style. "Both artists try to show the viewer the peace of mind and balance that they themselves experience when working from life" [6, 252].

- the artist's work V. G. Smagina has features of the symbolism style;

- all the artists' works are located inhorizontal composition, which corresponds to the breadth and expanse of the surrounding area of Lake Baikal.

Thus, in the course of the conducted research:

– scientific and specialized sources of literature related to the present research topic were presented;

– the methodology of this study was outlined;

– the characteristics of the protected areas of Lake Baikal were presented: the Olkhon Islands and the Shamanka Rock in the context of the literary work "Baikal-Lake Fairy Tales". "Favorite themes of both folklore and literary works were also poetic glorification of the beauty of the steppes and forests of the native land, poems and songs about Baikal, …" [5, 35];

– taking into account the description of the protected areas, landscape works of artists were examined M. I. DuBinsky "Shamanka Rock"1940; V. S. Rogal "On Olkhon. Baikal", 1968; V. G. Smagina "Baikal. Olkhon», 1983

References

1. Lake Baikal Tales. Collection. Book 1 / Comp. N. I. Esipenok. – Irkutsk: East Siberian Book Publishing House, 1989. – 287 p.

2. Gomboeva M. I. Contemporary Buryat Art// In the collection: Art education and contemporary art. Proceedings of the international scientific and practical conference. – 2023. – P. 7–13. – URL:(date accessed: 31.05.2025).

3. Lareva T. G. History of Fine Arts of the Baikal Region of the 20th – Early 21st Century. Irkutsk, Print Line, -2015.-615 p.

4. Lyashenko E. S. The Passing and the Current: Axiology of Symbols in the Paintings of the Artist I. V. Bukhogolova// In the collection: Art education: interdisciplinary socio-cultural environment, transmission of artistic values. Proceedings of the international scientific and practical conference. – 2021. – P. 48–58. – URL:(date accessed: 31.05.2025).

5. Manzyreva E. S. The Image of Eastern Siberia and its Reflection in Regional Artistic Culture// Bulletin of the Kemerovo State University of Culture and Arts. – 2017. – No. 38. – P. 33–39. – URL:(date accessed: 31.05.2025).

6. Ozhegina M. O. Comparative and contrastive analysis of landscape painting of Transbaikalia and Altai// In the collection: Art education: traditions, trends, prospects. III International scientific and practical conference. – 2014. – P. 246–252. – URL:(date accessed: 31.05.2025).

7. Pokatsky V. A. Artistic creativity of S. Vronsky in the 60-70s of the XIX century. // In the collection: Actual problems of literary studies, linguistics and culture of Eastern Siberia, Mongolia and China. – 2021. – P. 173–183. – URL:(date accessed: 31.05.2025).

8. Syromyatnikova E. V. Methods of rendering the light-air environment in landscape painting// Capital of Science. – 2020. – No. 1 (18). – pp. 175–181. – URL:(date accessed: 31.05.2025).

9. Tkachenko O. S. History of the landscape genre: the problem of terminology// In the collection: Russia and the World in Historical Retrospect. Proceedings of the XXX International Scientific Conference dedicated to the 120th anniversary of the birth of the outstanding statesman A. N. Kosygin. – 2024. – P. 456–461. – URL:(date accessed: 31.05.2025).

DOI 10.34660/INF.2025.23.25.162

农业生物技术数字化——当前形势下农业生产的新趋势
DIGITALIZATION OF AGROBIOTECHNOCENOSES - A NEW TREND OF AGRICULTURAL PRODUCTION IN CURRENT CIRCUMSTANCES

Briukhovetskii Andrei Nikolaevich
Doctor of Technical Sciences, Associate Professor, Head of Department
Lugansk State Agrarian University named after K.E. Voroshilov,
Lugansk, Russia

Sudarkin Vasiliy Nikolaevich
Candidate of Technical Sciences, Associate Professor
Lugansk State Agrarian University named after K.E. Voroshilov,
Lugansk, Russia

Myzhyrytskyi Illia Igorevich
Master's student
Lugansk State Agrarian University named after K.E. Voroshilov,
Lugansk, Russia

摘要：当今世界需要一种全新的方法来进一步发展农业生产，这一点毋庸置疑。我们不会再像以前那样，将人类视为自然的“征服者”或“主人”，犯下许多错误，制造人为灾害的危险，并为了一时的超额利润而降低农业生产的效率。相反，我们应该将自然视为“伙伴”，并尊重其发展的基本规律。

关键词：农业生物技术群落、数字化、农业生产、流程。

Abstract. *Today we can hardly surprise anyone by the fact that the world needs a fundamentally new approach to the further development of agricultural production. Not the approach in which a human being acts as a "conqueror" or "master" of nature with a lot of blunders and mistakes creating the danger of man-made disasters and reducing the efficiency of agricultural production for the sake of one-time super-profits, but the approach in which nature is considered as a "companion" and the basic laws of its development are taken into account.*

Keywords: *agrobiotechnocenoses, digitalization, agricultural production, processes.*

Introduction. Today, one can hardly surprise anyone with the fact that the world needs a fundamentally new approach to the further development of agri-

cultural production. This is not an approach in which a human being acts as a "conqueror" or "master" of nature with many blunders and mistakes creating the danger of man-made disasters and reduce the efficiency of agricultural production for the sake of one-time superprofits, but the approach in which nature is considered a "companion" and the basic laws of its development are taken into account.

The development of digital technologies (DTs) contributes to further progress in the development of the strategy of "partnership" with nature in obtaining agricultural products and bringing technological progress in agricultural production to a new level.

Agricultural production has its specific characteristics that dictate the possibility of spreading the use of DTs rather than in any other area of the national economy. The main features are as follows:

- the involvement of living organisms in the technological process, the connection of the operating modes of technical equipment with plants, animals and people, resulting in random changes in the parameters of the production process and uncertainties in the control and management of agricultural facilities;
- the variety and complexity of production processes requiring digitization;
- the dispersion of controlled parameters in large zones, the random nature of natural changes.

The urgent need to digitize agricultural production is also confirmed by the events of the past two years related to the coronavirus factor, which, despite the deadly threat to humanity, encouraged the development of digital technologies in agriculture. Farmers around the world have begun to actively use messengers, specialized platforms, and other digital solutions.

Besides, the development of digital technologies in agricultural production can significantly increase the efficiency of resource management in large open non-equilibrium systems operating in a given area with the necessary exchange of energy and substance with the environment and representing a set of biological and technical elements linked to a single agricultural production control loop called agrobiotechnocenoses (ABTC) [1].

This paper presents the results of using a technocenological approach to assess the efficiency of mobile energy units used in agriculture, in the context of the modern energy optimization concept of ABTC.

The global food crisis and disappointing forecasts for agricultural consumers of price increases on the international market create a large-scale problem of food security for most countries. The integration of this problem solution is confirmed by the pandemic situation. Coronavirus forced people to change their outlooks and lifestyles.

The activity of the agricultural sector in the economy, despite the expanding borders of the pandemic, continues as before, and agricultural products are still on sale. However, behind the obvious prosperity, there are several factors that threaten not only the financial stability of individual farms, but also the food security of the whole region. The common problems for global agricultural production are labour shortages, logistical issues during the storage and distribution of products, the strategy choice for further development.

Agro-industrial production of the 21st century is a symbiosis created by the integration of agriculture and industry, which is a complex open system with an essential function of obtaining, processing, storing and delivering agricultural products to the consumer. This system is a combination of numerous interacting subsystems with different kinds of processes (social, biological, informational, technical, environmental, etc.). A distinct feature of the study of this system at this stage is the complexity and impossibility of establishing the causality that occurs because it functions and leads to different phenomena (often negative, leading to errors in the determination of technical and investment policy, ensuring harmless interaction of biosystems with the technosphere).

In the last 20-30 years, artificial technologies and equipment have become comparable in the power of their impact on the environment with the forces of nature, it is reasonable to talk about the existence of a technosphere on the planet as well as the biosphere, which, in terms of capacity and scale of its impact on nature and man, has acquired a global and pernicious character. The impact of the technosphere on man and the environment does not bypass agricultural production [1].

At the same time, the technosphere helps the farmer to achieve a completely new level of power load. The formation and development of the technosphere during the evolution of agro-industrial production leads to the partial replacement of the natural communities of living organisms-biocenoses on the surface of our planet with artificial communities of organisms and technical objects.

At present, general and applied cenology is being studied in various areas of knowledge.

The historical beginning of the cenology is marked by the conclusion of the German hydrobiologist K. Moebius, who discovered that natural communities have a long history of adapting species to each other, which led to the emergence of the term “biocenosis” (from Greek βίος *bios* “life” and κοινός *koinos* “general”), i.e., the collection of plants, animals and microorganisms that have adapted to interact in a certain habitat.

Because of the population growth of our planet, human food needs are also increasing. As a result, natural (primary) biogeocenoses are replaced by fields, orchards, vegetable gardens, artificial meadows, farms. At the same time, a person

uses powerful technical systems in their activities. This is how agrobiogeocenoses are formed.

By transforming the natural environment for their purposes, man creates an open system due to the impossibility of a closed system that has no connections to the external environment or contains no internal connections.

Because of the emergence and even more powerful development of the technosphere, Professor B.I. Kudrin introduced the concept of technocenosis as a limited in space and time interconnected set of further indivisible technical items-individuals, united by weak bonds. The connections in technocenosis are of a particular nature, which is due to the constructive and, in most cases, technological independence of individual technical products and to the variety of tasks being solved.

Significant development of B.I. Kudrin's idea about the property of the commonality of cenoses of any nature was obtained in the works of his students: V.V. Gnatyuk, B.V. Zhilin, O.E. Lagutkin, Yu.V. Matyunina, M.G. Oshurkov, V.V. Prokopchik, V.V. Fufaev, etc., as well as in the works of outstanding scientists: R.V. Gurina, Yu.K. Krylov, V.K. Lozenko, et al., which was the basis for certain completeness of the cenological theory being in line with synergetics, fractality, self-organization and non-Gaussian distributions.

Unfortunately, so far, the technological approach of the cenological concept has not been widely applied in the study of agro-industrial production processes.

The inseparable unity of biology and technology is inherent in the cenoses of the agricultural direction at the present stage, but at the same time it is necessary to control their difference.

Thus, agroindustrial production at the beginning of the third millennium is characterized by the fact that it is based on agrobiotechnocenosis (ABTC), which is understood as a large open non-equilibrium system with irreversible processes occurring within it. ABTC operates on a given territory with the exchange of energy and substance with the environment. ABTC is a set of biological and technical elements linked by a single control loop.

Now agrobiotechnocenoses occupy about 10% of the earth's surface, producing about 2.5 billion tons of agricultural products annually.

At the same time, it is natural to assume that these systems can only be fully optimized if they are digitized.

Both existing agrobiotechnocenoses and projects can be digitized for optimization purposes. Herewith, the main tasks are as follows:

- Create digital methods, technologies and technical means to monitor fields, collect digital data on plants, animals, and beneficial microorganisms, digital methods to compile and update soil maps, and methods for updating and using breeding and genetic material.

- Introduce digital tools for the use of information resources, platforms and technologies in agricultural facilities that enhance the efficiency of agricultural production.
- Create technologies and technical means for automation, robotization, and intelligent agricultural production.
- Develop specialized software for agricultural platforms and management of "smart agriculture".

Provide agricultural production participants with a management system for the distribution of energy resources and diagnostics of agricultural machinery, as well as systematic review tools, production planning and management tools with elements of BigData and AI.

Create technologies that simplify the workflow process between government entities, agricultural producers, farmers, consumers of agricultural products for government services and commercial contracts, land and property titling, consultation, registration of subsidies, and other processes.

Use financial and regulatory instruments to control seasonal slowdowns and logistics and transport management instruments.

Develop specialized agricultural education for digital farming.

Please do not alter the formatting and style layouts which have been set up in this template document. As indicated in the template, papers should be prepared in double column. Leave a line clear between paragraphs.

Materials and methods. Ensuring food and energy security is a global problem for humanity at the present and near future stages. The urgency of resolving these problems is confirmed by the current situation in the world with climate, demographic and social changes.

Published by the Council of Lisbon and Ecofys and QuintelIntelligence, with the support of Philips, the analysis "Energy efficiency and economic prosperity-2015" identified the great potential to improve economic performance and significantly improve social and environmental benefits through optimal use of global energy.

This is the first world study that ranks countries for their energy production per unit of consumed energy. Authors warn that the current growth rate of this indicator, which is currently around 1.3% per year worldwide, is too slow to increase energy demand [1].

The world agri-food sector is undergoing a qualitatively new phase of development, coupled with structural changes in raw materials and processing industries, increased transnationalization of production and consumption processes, changes in the interaction of market mechanism elements, the construction of new investment conditions and standards, the strengthening of the impact of regulatory rules and measures on the production and turnover of agricultural products, according

to the Professor L.S. Revenko [2]. All of this occurs in the midst of an acute shortage of energy resources.

At present, 1% of crop growth represents 2.5% or more of the increase in anthropogenic costs. Therefore, issues of energy saving at all stages of the production cycle - seed preparation for sowing, cropping of plants, animals, and the processing of production, considering the redistribution of energy supply to reduce anthropogenic energy in favor of natural, mainly solar, is an urgent task of agricultural organization and management [3]. Optimization of energy savings should be carried out simultaneously at micro and macro levels. The micro-level optimization is to improve the individual technical products according to the criterion of "utility - energy consumption". A significant number of studies have been devoted to this topic, and this work does not address it. Macro-level optimization requires a system-wide approach. However, the current development of systemic research and its instrumental support does not allow algorithmically linked continuous optimization of energy consumption in agricultural production.

At present, in Russia and abroad, the cenological approach is generally recognized in engineering, economics, biology, sociology, science studies, and other natural and social sciences. However, the rank analysis was practically not used in the agricultural field, so the approbation and adaptation of the cenological approach in agricultural production, taking into account its specifics, is an important task, which determines the relevance and novelty of our study.

The main method to study and analyze ABTS, as well as technocenosis, is rank analysis. Professor V.I. Gnatyuk interprets rank analysis as a method of studying technical systems, aimed at its statistical analysis and optimizing system structure. The rank analysis occupies an intermediate position between simulation modelling (for the effective design of certain types of technical products) and the operating research methodology.

The parameters, classified in technocenosis, are technical or physical quantities that characterize an individual: size, mass, energy consumption, energy, etc.

Based on the classical concept of rank analysis, the rank analysis of the ABTC includes the following steps-procedures: selection of technocenosis; establishment of species formation parameters; parametric description of technocenosis; construction of a range distribution (parametric or specific); construction of a parameter distribution of graphic range; construction of a graphical range species distribution; approximation of distributions; optimization of technocenosis.

The first procedure in the rank analysis is ranking. Individuals are arranged in descending order of the quality level studied.

The rank distribution refers to the distribution obtained as a result of the ranking procedure for the sequence of parameter values assigned by the range. Rank is the number of an individual in the rank sequence. According to B.I. Kudrin, the

law of the rank distribution of individuals in the technocenosis (H - distribution), has the form of hyperbola and is analytically expressed by the relation:

$$W = \frac{A}{r^{\beta}}, \quad (1)$$

where A - the maximum value of the parameter of an individual with rank 1;

r - rank number;

β - the rank coefficient, characterizing the degree of curvature of the distribution curve.

The process of determining β is particularly difficult Let's perform the dependency linearization process (1)

$$\ln W = \ln A - \beta \ln r \quad (2)$$

Defining that.

$$\ln W = y \qquad \ln A = B = const \qquad \ln r = x$$

Getting (2) in the form:

$$y = B - \beta x. \quad (3)$$

Equation (3) is a decreasing linear function. The slope of the line graph to the abscissa axis will be marked as β, i.e. $\beta = tg\alpha$.

In addition, β can be determined from the equation (2):

$$\beta = \frac{\ln A - \ln W}{\ln r}.$$

The coefficient A is determined from the condition: r=1, W_1=A.

The use of the methodology of rank analysis is possible, for example, in order to study the issues of completing the tractor fleet in agricultural production.In recent decades there has been a change in the direction of the scientific and practical tasks faced by specialists working in the field of completion and operation of tractor fleets in agriculture.

These changes are caused by the introduction of new technologies for agricultural production, resulting in the transfer of the agricultural tractor concept from the category of traction machines to traction power vehicles (TPV).

Thus, a modern TPV can be considered not only as the main element of the energy-technological complex of agriculture, which is the basis for completing units of versatile technological vehicles, but also as part of a technical cluster composed of individual tractors, united by weak connections and weak interactions, which are in most cases determined by the technological need and the variety of production tasks to be solved. This set of technical products is essentially a technocenosis or an ABTC subsystem (one of the coenoses)

To explain concepts such as "weak" and "strong" connections in technocenosis, refer to the following example.

An agricultural tractor, which is a complex technical system, is a combination of subsystems consisting of subassemblies and parts. During operation, there are mechanical, electrical, hydraulic or pneumatic connections between the tractor

subsystems. These connections are based on the laws of physics. Its essence is clear and fully accessible. Such connections are generally called strong. The regional TPV park, for example, is also a complex technical system. Some connections between the components of this system (the individual tractors) are visible (one state, similar natural and climatic conditions, a common market for spare parts, etc.), but these connections can be considered vanishingly weak.

There is also an intermediate system - the tractor fleet of a separate agricultural company.

According to the authors research the methodology for the study of technocenoses (in the framework of the ABTC) is an objective instrument for the planning and evaluation of the efficiency of mobile energy units in agricultural production [4].

The structure of the analysis model is implemented on platforms as well known and extensive as Excel and MathCAD, package usage STATIATIKA, as well as on more advanced MATLAB and AnyLogic, whichConclusion

Conclusion. Thus For agricultural production at the present stage, the inseparable unity of biocenoses and technocenoses is inherent, which allows us to introduce the concept of agrobiotechnocenosis.

The transformation of agriculture into a competitive technology industry with high labor productivity and low energy costs requires a technological shift, an integral part of which is the introduction of digital technologies into agro-industrial production using artificial intelligence, automation and digital platforms. An effective tool to achieve a new level of digitalization is the digitalization of agrobiotechnocenoses, which will enable:

- to reduce possible risks through digitally-based modeling;
- to make climate change-related adjustments due to the introduction of precision farming systems;
- to increase crop yields and animal productivity through the automation of agricultural operations;
- to reduce the costs of agricultural production by optimizing production.

References

1. Briukhovetskii A.N. (2016) Energy saving in agrobiotechnocenosis as a basis efficient agro-industrial production the beginning of the third millennium-Articles collection of the I International scientific-practice conference is the «Modern ecological problems and ways of their decision», devoted the anniversary of the Lugansk national agrarian university (Lugansk, November, 22-23,). - Lugansk: LNAU, 2016. 492.

2. Revenko L. (2012) Food security: the solution is possible [Electronic resource] // APEC of Russia: Internet portal. - Access mode: http://mgimo.ru/files/226753/2012-09_interaffairs_Revenko.pdf.

3. Gordeev A. S. (2014) Energy saving in agriculture: textbook. manual / A. S. Gordeev D. D. Ogorodnikov, I. V. Yudaev. - St. Petersburg: Publishing House "Lan" 400.

4. Briukhovetskii A., Briukhovetskii Y. (2016) Modern concept of energy optimization of functioning of agrobiotechnocenosis Models and technologies of environmental management (regional aspect). №1(2) 96-103.

DOI 10.34660/INF.2025.47.74.163

自动处理单变量数据集以识别科学研究中的异常值
AUTOMATED PROCESSING OF UNIVARIATE DATASETS FOR IDENTIFYING OUTLIERS IN SCIENTIFIC RESEARCH

Klimau Yury Valerevich
Candidate of Technical Sciences, Associate Professor
Belarusian National Technical University

摘要：本文探讨了实验结果中出现过失误差的原因，并提出了一种用于识别科学研究中异常值的一维数据集的自动化处理技术。

关键词：自动化处理、统计数据、过失误差、异常值、样本、电子表格处理器、格拉布斯检验、科学研究。

Abstract. *The causes of gross errors in the experimental results are considered and a technique for automated processing of a one-dimensional data set for identifying outliers in scientific research is proposed.*

Keywords: *automated processing, statistical data, gross errors, outlier, sample, spreadsheet processor, Grubbs test, scientific research.*

In a scientific experiment, during statistical processing of experimental data, special attention should be paid to the analysis of gross errors in the output measurement results that stand out from the general sample and are far beyond other observations. In mathematical statistics, they are called outliers. The presence of these errors significantly affects the experimental results, so it is important to know the reasons for their origin [1]. On this basis, it is possible to use methods for identifying and reducing their negative impact on the output results.

The causes of gross errors may be:

– measurement errors. This reason may be associated with incorrect operation of the equipment. For example, incorrect sensor setup and calibration, as well as incorrect output data collection settings in the software (copying output data, writing to a file, etc.);
– operator errors when entering (outputting) data. This is caused by errors made by the performer when entering, collecting, or recording data. Often, such errors are associated with the lack of a method for collecting initial data;

– data processing errors. When performing automated calculations, incorrect and unverified formulas with incorrect settings in an arbitrary range are used, that is, an incorrect method for processing results;
– errors in pre-processing (preparing) the sample. They are the result of incorrectly adding or cutting out part of the "unnecessary" data from the sample;
– errors in conducting the experiment. Outliers occur during measurements under conditions of exposure to sudden changes in unaccounted factors: temperature increase, vibration level, pressure surges, etc.;
– natural emissions. A natural surge in some indicators occurs during equipment operation and data collection. Based on the analysis of the above reasons for outliers, before excluding a particular value, it is necessary to make sure that this is indeed a gross error (outlier), and not a deviation due to statistical scatter of data. Therefore, an important role is given to statistical tests (criteria) designed to check and exclude outliers from the sample.

A sample (sample population) is a part of the general population of elements that is covered by an experiment (observation, survey). For example, as a result of a scientific experiment, there is a sequence of independent random variables x1, x2, ..., xn that have the same probability distribution law.

To find outliers, there are well-known methods based on the "three sigma" rule, Z-score, interquartile range, Grubbs test (criteria). Standard tests are quite simple to implement and usually require calculating the mean, standard deviation and median.

As a practical example, this paper uses Grubbs' test to identify outliers in a univariate data set that follows a normal distribution (Figure 1).

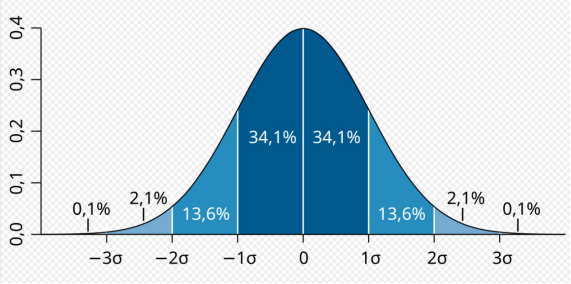


Figure 1. *Probability density graph of normal distribution*

The method of using the Microsoft Excel spreadsheet processor to analyze gross errors (outliers) of measurement results is as follows:

1. Create a table title (x – initial experimental data; f(x) – probability density of normal distribution; F(x) – integral function of normal distribution; G – calculated Grubbs criterion) in cells A1:D1.

2. Enter the initial measurement data into the Microsoft Excel table in cells A2:A31 (for example, the sample size is 30 values).

3. Replace the periods in the numbers with commas using the “Replace” command if necessary.

4. Arrange the data in ascending order using the “Sort ascending” command.

5. Find the average value of the sample using the Function Wizard in the “Statistical” category and the AVERAGE(A2:A31) function.

Average value $\overline{X}$ is an approximate statistical estimate of the mathematical expectation M(X) for the general population.

The calculation of the average value ¯X is performed according to formula 1

$$\overline{X} = \frac{1}{N} \cdot \sum_{i=1}^{N} X_i \qquad (1)$$

where N – sample size of the experimental results.

6. Find the standard deviation of the sample using the STDEV.B(A2:A31) function.

Standard deviation S_x – statistical characteristic of the distribution of a random variable, showing the average degree of dispersion of the values of the variable relative to the mathematical expectation M(X).

The standard deviation is measured in units of the random variable itself and is used in calculating the standard error of the arithmetic mean, in constructing confidence intervals, in statistical testing of hypotheses, and in calculating variation indices.

The standard deviation is estimated based on an unbiased estimate of the dispersion using formula 2

$$S_x = \sqrt{\frac{1}{N-1} \cdot \sum_{i=1}^{N} \left(X_i - \overline{X}\right)^2} \qquad (2)$$

A high value of the standard deviation shows a greater spread of observed values of the feature relative to the mean, a lower value shows that random variables in the set are grouped around the mean.

7. Find the coefficient of variation using formula 3.

The coefficient of variation v_x is defined as the ratio of the standard deviation $S_{\_x}$ to the mean value $\overline{X}$:

$$v_x = \frac{S_x}{\overline{X}} \qquad (3)$$

The coefficient of variation characterizes the relative measure of dispersion of X_i around the mean value $\overline{X}$.

8. Calculate the values of the probability density of the normal distribution using the NORM.DIST(A2;A32;A33;0) function in cells B2:B31 and plot the density graph.

9. Calculate the values of the cumulative function of the normal distribution using the NORM.DIST(A2;A32;A33;1) function in cells C2:C31 and plot the cumulative function graph.

10. Adjust the X-axis labels for the two graphs provided.

11. Check the shape of the normal distribution density curve and the variation coefficient, which should be less than 0.33 to establish compliance with the normal distribution law.

12. Calculate the Grubbs criterion for cells D2 and D31 using formulas 4 and 5 (Figure 2), assuming that the smallest or largest measurement result is caused by gross errors, using formula 5 of GOST R 8.736—2011 [2]. The Grubbs criterion is calculated for the minimum and maximum values using the following formulas:

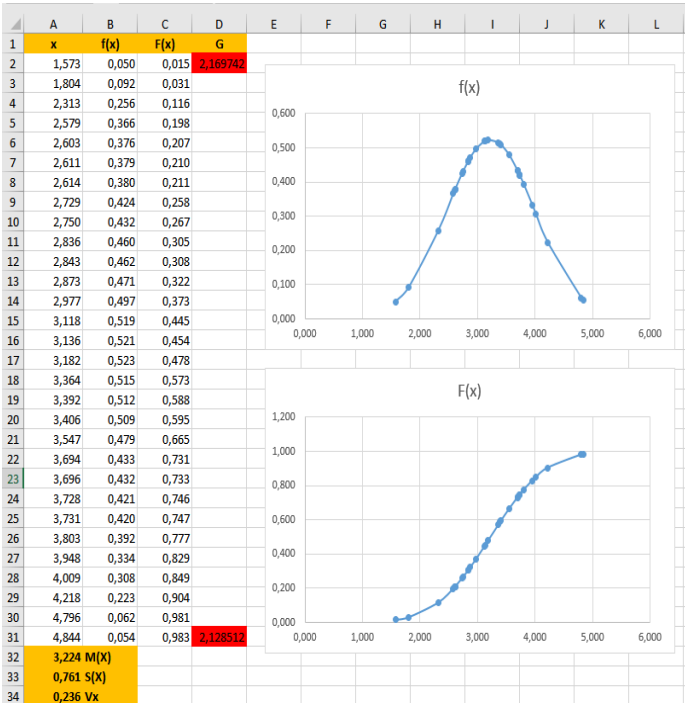
$$G_{min} = \frac{(\bar{x} - x_{min})}{S_x} \qquad (4)$$

$$G_{max} = \frac{(x_{max} - \bar{x})}{S_x} \qquad (5)$$

13. Compare the calculated values with the theoretical values of the Grubbs criterion depending on the sample size and the selected significance level using Appendix A of GOST R 8.736—2011 [2]. If the calculated value for the smallest (largest) result is greater than the table value, then it is excluded as unlikely. If the calculated value is less than the table value, then it is not considered an outlier (miss) and is retained in the sample.

14. Repeat the check for gross errors, for which the arithmetic mean and standard deviation of a number of measurement results are determined.

Thus, a technique using the Microsoft Excel spreadsheet processor is proposed for automated processing of a one-dimensional set of experimental data and determining outliers. This technique will reduce the labor-intensive process of statistical processing and can be successfully used in various sectors of the economy when conducting fundamental and applied research in scientific organizations, in production and in educational institutions.



	x	f(x)	F(x)	G
1	1,573	0,050	0,015	2,169742
2	1,804	0,092	0,031	
3	2,313	0,256	0,116	
4	2,579	0,366	0,198	
5	2,603	0,376	0,207	
6	2,611	0,379	0,210	
7	2,614	0,380	0,211	
8	2,729	0,424	0,258	
9	2,750	0,432	0,267	
10	2,836	0,460	0,305	
11	2,843	0,462	0,308	
12	2,873	0,471	0,322	
13	2,977	0,497	0,373	
14	3,118	0,519	0,445	
15	3,136	0,521	0,454	
16	3,182	0,523	0,478	
17	3,364	0,515	0,573	
18	3,392	0,512	0,588	
19	3,406	0,509	0,595	
20	3,547	0,479	0,665	
21	3,694	0,433	0,731	
22	3,696	0,432	0,733	
23	3,728	0,421	0,746	
24	3,731	0,420	0,747	
25	3,803	0,392	0,777	
26	3,948	0,334	0,829	
27	4,009	0,308	0,849	
28	4,218	0,223	0,904	
29	4,796	0,062	0,981	
30	4,844	0,054	0,983	2,128512
31	3,224 M(X)			
32	0,761 S(X)			
33	0,236 Vx			

Figure 2. *Results of calculating the Grubbs criterion for determining outliers in a one-dimensional data set*

References

1. Klimov, Yu.V. Automation of checking and eliminating outliers in a one-dimensional data set in the process of scientific research / Yu.V. Klimov // Problems of forecasting and state regulation of socio-economic development: materials of the 25th International scientific conference (Minsk, October 17-18, 2024). - Minsk: NIEI of the Ministry of Economy of the Republic of Belarus, 2024 - P. 252-253.

2. GOST R 8.736-2011. State system for ensuring the uniformity of measurements. Direct multiple measurements. Methods of processing measurement results. Basic provisions; introduced 01.01.2013. - M.: Standartinform, 2013 .-- 25 p.

DOI 10.34660/INF.2025.72.16.164

西北太平洋热带气旋在气象紧急情况预报中的应用
TROPICAL CYCLONES IN THE NORTHWEST PACIFIC OCEAN IN THE CONTEXT OF FORECASTING METEOROLOGICAL EMERGENCIES

Gordienko Aleksey Nikolaevich
Deputy Director
Polar Geophysical Institute,
Murmansk, Russia;
State Counselor of the Russian Federation

Lekarev Yuri Dmitrievich
Senior Research Officer
All-Russian Research Institute for Civil Defense and Emergencies of the EMERCOM of Russia" (Federal Center for Science and High Technologies),
Moscow, Russia

摘要。本简短研究的意义在于，需要将俄罗斯与外国在西北太平洋热带气旋（TC）的演变和行进监测方法进行对比，并及时获取预报信息。

热带气旋起源于菲律宾和帕劳岛附近的太平洋，途经日本和琉球群岛，影响越南领土、朝鲜半岛、中国东部地区，并到达俄罗斯远东地区，包括千岛群岛、萨哈林岛、堪察加半岛和滨海边疆区，这些地区最容易受到 TC 的破坏性影响。此类气旋行经这些地区将造成极其严重的后果。

俄罗斯预防和消除气象紧急情况的整个系统的主要任务之一是完善自身的预报机制，并与外国国家机构和服务机构进行国际层面的互动，以获取最新的 TC 预报信息。

本文的主要结论是，需要彻底改变和普及热带气旋起源和行进的预报方法，并加强相关国家在预报机构专家国际合作方面的合作。

为了更清楚地说明，本文简要概述了2023年8月袭击俄罗斯远东地区并造成灾难性后果的气旋"卡努姆"的行进过程。

关键词：热带气旋、紧急情况、气象现象预报、太平洋、飓风、台风、远东、极端气候、自然灾害。

Abstract. *The relevance of this brief study is due to the need for a correlation between Russian and foreign approaches to monitoring the evolution and passage of tropical cyclones (TC) in the northwestern Pacific Ocean, and the most timely receipt of forecast information.*

Originating in the Pacific Ocean relatively close to the Philippines and Palau Island, tropical cyclones pass Japan and the Ryukyu Islands, affect the territory of Vietnam, the Korean Peninsula, the territory of eastern China, and reach the Russian Far East, including the Kuril Islands, Sakhalin Island, Kamchatka and Primorsky regions, which in this case are most susceptible to the destructive effects of TCs. The consequences of the passage of such cyclones through the territory have extremely tragic consequences.

One of the main tasks for the entire Russian system of prevention and elimination of emergency situations of meteorological origin is positioned as both the improvement of its own forecasting mechanisms and interaction at the international level with foreign national institutes and services in order to obtain the most up-to-date forecast information about TCs.

The main conclusion made in this article is related to the need for a radical change and universalization of methods for forecasting the origin and passage of tropical cyclones, as well as the consolidation of interested states at the level of international cooperation of specialists from forecasting organizations.

For a clear illustration, the article provides a brief overview of the passage of cyclone KHANUM, which hit the Russian Far East in August 2023 and led to catastrophic consequences.

Keywords: *tropical cyclones, emergencies, forecasting meteorological phenomena, Pacific Ocean, hurricane, typhoon, Far East, climatic extremes, natural disasters.*

Tropical cyclones (TCs) are one of the most catastrophic and destructive natural phenomena. Based on the criteria of information on marine hydrometeorological phenomena developing into emergency situations (ES) established by the EMERCOM of Russia [1] (hereinafter referred to as the criteria of the Russian Emergencies Ministry), a number of natural characteristics of tropical cyclones are classified, which ensures the minimization of their consequences, protection of the population, socio-economic and industrial infrastructure in the territory affected by cyclones. Thus, meteorological extremes accompanying TCs are recognized as hurricane-force winds, huge ocean waves, heavy rainfall and the floods caused by them, landslides and mudflows, as well as thunderstorms. The terminology of such a phenomenon as a “tropical cyclone” is standardized in the Russian Federation. This is an atmospheric disturbance with low air pressure and hurricane-force wind speeds that occurs in tropical latitudes and causes enormous destruction and loss of life [2]. Meanwhile, “typhoon” is only a traditional name for tropical cyclones, usually occurring in the area of the South China Sea and the Philippine Islands. TCs are called typhoons in the Far East and Southeast Asia and Oceania, as well as in the Pacific territories of the United States. The storm turns into a hurricane - destructive winds with a speed of

>32.7 m/s (12 points and higher on the Beaufort scale). At a speed of >117 km/h (or >32.5 m/s) on land, winds turn into hurricanes (although the Beaufort Scale does not distinguish the characteristics of a hurricane when it comes ashore, despite the fact that this is observed periodically).

Wind gusts with a speed of ≥ 25 m/s or a stable wind with an average speed of ≥ 20 m/s (on the coasts of the seas and in mountainous areas with a stable speed of ≥ 30 m/s) in themselves constitute emergency situations (clause 2.3.1. of the criteria of the EMERCOM of Russia). A separate indicator in the form of a hurricane wind (hurricane) is recognized as a wind speed in the waters of the oceans, Arctic, Far Eastern and/or Antarctic seas (including gusts) ≥ 30 m/s, in the waters of other seas ≥ 25 m/s (clause 2.4.2. of the criteria of the EMERCOM of Russia). TCs are also long-term marine gravity wave atmospheric vortices formed in tropical latitudes and having low atmospheric pressure in their central part, with a diameter of, on average, 100 - 300 km [3]. The Pacific Ocean is a territory of special attention, it is the most active region in terms of the number of TCs, which determines the relevance of the attention of the scientific world to it. The Pacific Ocean generates an average of 30 typhoons per year, and this figure can increase to 80. About a third of them originate in the northwestern part of the ocean [4]. The Pacific Ocean has a small area, its own characteristics of air and sea flows, which create favorable conditions for the formation.

In addition, one of the main reasons for the occurrence of TCs are climatic conditions. The origin and evolution of TCs are classified as synoptic processes in the troposphere, which corresponds to some characteristics of the environment (changes in the vertical structure of the atmosphere, as well as the impact on precipitation), obtaining data on which is a condition for forecasting:

1) high ocean surface temperature, change in water density (air heating and the formation of convection currents that form the origin of tropical cyclones, change in atmospheric pressure);

2) intensification of air exchange between the troposphere and stratosphere, change in the magnitude of vertical movements;

3) the presence of a corridor of horizontal movement that promotes the process of accumulation of cyclone power, comfortable movement of cyclones from east to west (“Pacific corridors” are the most favorable place on Earth), as well as curvilinear movement of air along concentric trajectories around a zone of low pressure under the influence of Coriolis forces.

The territory of the Russian Far East and the Far Eastern seas, the northeastern part of China, is annually exposed to the influence of TCs formed in the northwestern part of the Pacific Ocean. In the last decade, the number of TCs that have influenced the Far Eastern regions of Russia has increased significantly (in 2014 -

3, in 2015 - 7, in 2016 - 9, in 2017 - 4, in 2018 - 7). Already in 2016, their number exceeded the largest number (5 cyclones) for the period from 1970 to 2011 [5].

The area of occurrence of TCs reaching the Far Eastern regions of Russia is limited by the coast of East Asia in the west, the equator in the south and the international date line in the east, limited by coordinates 4.7–30° N and 116–176° E. The greatest number of typhoons occurs in June–September, and there are practically no typhoons in the period from November to April. From the center to the border of this zone, TCs occur less frequently, but a significant number of TCs are formed on the west coast of Japan due to the combination of the cold Oishio Current with the warm coastal waters of the China Sea [6].

After the main formation, TCs move to the shores of China and Korea. At latitudes of 20–25°, they turn to the northeast, often passing through the southern Japanese islands and in some cases reaching Primorsky Krai (34 times over the past 70 years).

After passing through Korea, Japan and the Ryukyu Islands, TCs can reach the Russian Far East. The Kuril Islands, Sakhalin, and Primorsky Krai are most susceptible to their destructive power. The largest number of TCs reach Primorye and the Kuril Islands, and the smallest number reaches Khabarovsk Krai and the Kamchatka Peninsula.

In the period from August 3–4, 2023, over the waters of the East China Sea, with a fairly high water temperature of ≈ 29 °C, KHANUM began to fill. By the synoptic time of 18 UTC on 04/08/2023, it had reached the stage of a strong tropical cyclone with a pressure of ≈ 970 hPa [7]. The Japan Meteorological Agency (JMA), which is authorized to be responsible for hydrometeorological support for the northwestern Pacific Ocean, announced the formation of a low-pressure area and a tropical atmospheric depression [8]. Having formed in the Philippines (initially designated by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) as “Phalcon”), KHANUN passed near the island of Ryukyu, along Okinawa (Japan) and the west coast of the Korean Peninsula, at a speed of 31 km / h, across the territory of South Korea, bringing with it torrential floods and destructive hurricane winds at a speed of 24 m / s (according to data confirmed at 16:00 08/10/2023).

KHANUN was immediately characterized by scientists as “very strange” due to its unpredictable and non-standard zigzag trajectory.

Usually, the source of information about TCs is data received from Russian spacecraft (usually these are images of the optical and infrared ranges). Open information obtained from foreign sources, from foreign spacecraft is also used. For example, it is known that the JMA has been tracking KHANUN based on space observation data since it formed near the Philippines [9]. In Russian practice, the main part of TC formation and forecasting is based on tracking cloud points by

identifying and then tracking characteristic points on satellite images. Initially, data is accumulated for the required time period (from 6 hours to 3 days from the current analyzed moment), and the necessary data are interpolated if they are missing [10], [11]. Then, TC trajectories are calculated depending on the location of the turning point of cloud points. In a special appeal of the United States Navy/ Air Force Joint Typhoon Warning Center (JTWC) in Hawaii, an official typhoon warning Tropical Cyclone Formation Alert (TCFA) is a text message (telegram) containing a disturbance designation that becomes the subject of a warning on behalf of the JTWC during the next 24-hour period. The storm's position and established direction, wind speed and distribution, and possible forecasts are also indicated. For the northern Pacific Ocean, warnings are updated every six hours. TCFA does not contain any other more detailed data or indication of the movement of reference points [12], [13].

It should be noted that JTWC and JMA provide similar, but slightly different in detail, forecasts of TC trajectories for the entire forecast period, which confirms some inconsistency between these services, and, consequently, the relative reliability of the forecast based on their materials. The estimates and forecasts of the intensity of the Japanese and American agencies coincide in variability, but differ in absolute values. In addition, the JMA operational forecasts of TC development have been steadily improving since 1982, which is due to differences in the characteristics of TCs. The improvement in forecasting that began in 2015 is associated with the introduction of the "consensus method" using four global numerical models ECMWF, JMA, NCEP and UKMO for operational forecasts. Moreover, the planned "errors" in 2023 were 61, 110, 165, 249 and 356 km for 24-, 48-, 72-, 96- and 120-hour (lead time) forecasts, respectively. With such "professional" control, on August 9-10, KHANUN reached the Russian coast of the Pacific Ocean and the territory of the Russian Far East [14].

Only on August 14, 2023, in accordance with the user request of the EMERCOM of Russia (User Request Form), the International Charter Space and Major Disasters (ICSMD document) was activated, in order to use space and related ground resources of the ICSMD document participants to obtain data and information on emergencies, according to which materials from foreign spacecraft (for example, the Radarsat-3 spacecraft of the Canadian Space Agency) became available to Russian specialists. At that time, the water level in several Russian rivers had already exceeded the norm by four times, and the Razdolnaya River in Primorsky Krai by six times. From 15.08.2023, a state of emergency was declared in Primorsky Krai and adjacent areas [15].

It should also be noted: for predicting the movement and evolution of emerging typhoons, it is very convenient to use the prognostic interactive meteorological maps of the Korea Meteorological Administration (KMA), which allow achieving

very satisfactory results. A review of data from KMA resources by specialists from the Research Center for Monitoring and Forecasting Emergencies (in the EMERCOM of Russia system) made it possible to extrapolate a sufficient idea of KHANUN's approach to Russian territory already in the first days of August, that is, before receiving information in the state system at the request of the EMERCOM of Russia [16], [17], [18]. The conclusions about the passage of KHANUN, made on the basis of the used digital model HWRF-Ru, were compared with the forecast conclusions of Russian centers providing official information to Russian governing bodies of the Unified State System for Preventing and Liquidation the Emergency Situations (RSES). In the Pacific community, in the event of a tropical cyclone in an alarming area, a version of the WRF model is launched - the Hurricane WRF (HWRF) model, which differs from the usual model by the presence of a block for initializing the cyclone vortex and tracking its area. In the process of modeling, a specialized map of the predicted trajectory of the TC is formed from the zero date of origin to the maximum possible (for the HWRF-Ru model - this period is 72 hours). In this way, modern technologies for short-term forecasts of the position and intensity of TCs in the northwestern part of the Pacific Ocean for a period of 3 days with three-hour time detailing are used [19]. Areas of maximum winds are established. This modeling is used in forecast operational practice, although the abbreviation and order of tropical cyclone movement sectors are given in accordance with the ideology of the JTWC.

The conclusions of Russian experts take into account data obtained on the basis of the hydrodynamic numerical regional model of weather research and forecasting (WRF), which, in turn, allows for the rapid integration of data from satellites, radars and other instruments, creating simulations reflecting either real observations, atmospheric convection analyses, or idealized "template" atmospheric conditions. The TC intensity forecast prepared in this way has legal advisory status. Since the WRF modeling program is supervised by the US National Oceanic and Atmospheric Administration (NOAA) and the National Center for Atmospheric Research (NCAR), there remains a significant risk of information loss by Russian or Chinese users of this program. In addition, no heliogeophysical characteristics that provide a clear idea of the processes accompanying the passage of TCs in the troposphere are provided at the level of international information exchange; the WRF program does not assume the need to take them into account in detail. But the Russian HWRF-Ru scheme also provides information on the main parameters characterizing the position and intensity of the TC for each forecast period of time [20].

The implementation of participation since 05/22/1950 of the USSR and the Russian Federation in the World Meteorological Organization (WMO) allows Russian organizations to painlessly use JMA data [21], as well as JTWC.

In 2023, data from other national services that calculated the risk of KHANUN passing over the territory of their country were also taken into account (for example, the Philippine center Climate Monitoring and Prediction Section Climatology and Agrometeorology Division (CLIMPS) [22], which is under the jurisdiction of PAGANA, as well as Taiwan Central Meteorological Bureau (TCMB)).

Assessing the risk of a tropical cyclone in a given area of the planet involves analyzing the frequency and movement of trajectories and intensity of the TC, taking into account the influence of atmospheric circulation. There is strong evidence of the relationship between the frequency of TCs and various factors of their formation (including the forms of large-scale atmospheric circulation according to Wangenheim-Giers, the thermal state of the ocean surface, and others) [23].

Thus, monitoring and forecasting TCs involves tracking their behavior at the main stages, of which there are four:

1) formation: TCs begin to form from a tropical disturbance, deepening occurs over several days, accompanying atmospheric processes are diagnosed and taken into account;

2) a young cyclone: the TC develops either in the form of a shallow depression, moves over short distances and dies out, or the TC intensifies, the pressure in its center drops below 1000 hPa, a dense ring of hurricane-force winds with a radius of 40-60 km forms around the center.

3) within a few hours to a few days - maturity stage: the pressure drop stops, the wind speed reaches a maximum and does not increase any more, the radius of the storm winds is the largest, the storm wind zone is located mainly on the right side of the TC;

4) attenuation (dissipation) stage: from the moment the TC comes ashore or onto a cold sea current, either it gradually fades away, turning into a tropical depression, or turns into a powerful extratropical cyclone on the polar front and the forecast of emergencies as a result of its behavior must be calculated taking into account the geographical features of the territory through which the TC continues to move [24].

As a result of the passage of KHANUN 9-11.018.2023, infrastructure was significantly damaged: several bridges were torn down, an unfinished dam broke in the city of Ussuriysk. In the village of Dalzovodskoye in the Khorolsky District of Primorsky Krai, two teenagers died after getting caught in a stream of water drawn into a drainage system. In total, during the period of cyclonic impact, 5,648 residential buildings, 10,341 household plots, 98 road sections were flooded in 28 municipalities in 106 Russian settlements, and transport links with 101 settlements were disrupted. Power supply was disrupted in 8 municipalities in 20 settlements - a total of 3,536 houses (including 110 apartment buildings, 3,426 private houses), in which 22,256 people live, including 3,766 children. The tropical cy-

clone hit the western regions of Primorye the hardest. The strategic federal highway Khabarovsk - Vladivostok was blocked. Since the situation began to worsen, 7,850 people have been evacuated; police, military and rescue teams of the Russian Emergencies Ministry have rescued 1,638 people [25].

Thus, KHANUN, predicted by the services of different states in the manner described above, has shown: very clearly how tragic are the consequences of an insufficiently coordinated organization of monitoring and forecasting the PCs of shopping malls.

Conclusions

Despite the intensive development of modern technologies, the causes of TC occurrence require additional comprehensive study. The accuracy of forecasting the occurrence and evolution of TCs remains insufficient and should be the subject of more intensive research in countries particularly exposed to TCs.

With the clarification of the areas of TC occurrence extending to the Far Eastern regions of Russia, an increase in the number of TCs over the past decade has been established, which is undoubtedly a consequence of global climate change: oriented applied heliogeophysical studies should be included in a single TC forecasting system.

There is an obvious need for comprehensive international cooperation in TC forecasting, obtaining integrated information from any possible sources. In addition, it seems advisable to revise the protocol (regulations) of the international request for information on the use of space and related ground resources by operators of the ICSMD document participants to obtain early data and information on emergencies.

If TCs used to originate and fade away far from land, now they increasingly reach the continent, their consequences are felt much more acutely. Over time, typhoons will behave even more actively, moving north. In the near future, the entry of TCs formed in the Pacific Ocean into the territory of the Russian Far East and Northern China will become more frequent. In this regard, it seems necessary to radically revise and strengthen the forecasting system for the maximum possible advancement, monitoring and calculation of the possible behavior of cyclones. For these purposes, it is necessary to decisively promote the mutual integration of information systems and the correlation of forecast data in early warning of cyclones used by interested states with the most prompt receipt of all possible information.

References

1. Criteria for information on natural and technogenic emergencies, approved by order of the EMERCOM of Russia dated 05.07.2021 No. 429 (registered by the Ministry of Justice of Russia on 16.09.2021 under No. 65025) // Internet portal "Official publication of legal acts", http://publication.pravo.gov.ru, date of publication 16.09.2021 under No. 0001202109160036, date of access 04.05.2025;

2. GOST 22.0.03-2022. Safety in emergency situations. Natural emergencies. Terms and definitions. Section 2, items 64-65 / [Interstate Standard], introduced on 01.06.2023 // Federal State Budgetary Institution "Institute of Standardization", Moscow, 2023, p. 5;

3. Methodological recommendations for the use in forecasting practice of products of numerical short-term forecasts of dangerous convective weather phenomena in the summer period of the year / edited by Alekseev A. A. and Losev V. M. // Federal State Budgetary Institution "Hydrometeorological Research Center of the Russian Federation". Moscow, 2028, p. 67;

4. Ozerova N. A. Study of the features of the evolution of tropical cyclones influencing the weather of the Russian Far East / N. A. Ozerova // European Journal of Natural History. – 2023. – No. 1. – P. 29-34. – EDN ETWEOW.

5. "Pacific Decadal Oscillation / National Centers for Environmental Information (NCEI)". [Электронный ресурс] https://www.ncei.noaa.gov/ access/ monitoring/pdo/дата обращения: 04.09.2024.

6. Veryatin, V. Yu. Monitoring of tropical cyclones affecting the Far Eastern regions of Russia / V. Yu. Veryatin, A. S. Dyakov // Hydrometeorology and education. – 2023. – No. 1. – P. 43-51. – EDN HGUZWB.

7. Shadrin, A. V. Tropical cyclones of the 2023 season that affected the weather conditions of the Sea of Japan / A. V. Shadrin // Comprehensive research in the fisheries industry: Proceedings of the IX International Scientific and Technical Conference of Students, Postgraduates and Young Scientists, Vladivostok, November 24, 2023. - Vladivostok: Far Eastern State Technical Fisheries University, 2024. – P. 123-127. – EDN CGLRDF

8. Annual Report on the Activities of the RSMC Tokyo 04.08.2023 - Typhoon Center. URL: https://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/ annualreport.html, accessed: 12.05.2025.

9. Monitoring the consequences of Typhoon KHANUM in Primorsky Krai / Scientific Center for Operational Monitoring of the Earth of JSC Russian Space Systems [Electronic resource], URL: https://ntsomz.ru/ typhoon-impact-monitoring /, accessed: 04.09.2024.

10.Method for early detection of typhoon formation based on processing satellite cloud images and assessing the dynamics of meteorological conditions based on

publicly available resources / M. I. Trufanov, A. P. Smakhtin, A. I. Gazov, D. V. Fedosenko // Information technologies and mathematical modeling of systems 2020: Proceedings of the international scientific and technical conference, Odintsovo, Moscow region, November 16-19, 2020. - Odintsovo, Moscow region: Federal State Budgetary Institution of Science "Center for Information Technologies in Design of the Russian Academy of Sciences", 2020. - P. 75-80. - DOI 10.36581/CITP.2020.69.64.019. - EDN BYJRGF.

11. Gridin V.N., Smakhtin A.P. Physical modeling of magnetohydrodynamic processes of development of powerful tropical cyclones / Proceedings of MAI. Issue No. 109. DOI: 10.34759/trd-2019-109-7

12. Naval Oceanography Portal // URL: https://www.metoc.navy.mil/jtwc/jtwc.html?faq [Electronic resource], accessed 09/03/2024;

13. Tropical cyclone warnings // United States Navy/Air Force Joint Typhoon Warning Center, URL: https://Joint_Typhoon_Warning_Center, [Electronic resource] Accessed 09/03/2024;

14. Annual Report on the Activities of the RSMC Tokyo - Typhoon Center 2023. Chapter 4 Verification of Forecasts and Other Products in 2023 / URL: https://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/AnnualReport/2023/Text/Text2023.pdf. accessed: 01.06.2025, C. 14

15. Monitoring the consequences of Typhoon KHANUM in Primorsky Krai / Scientific Center for Operational Monitoring of the Earth of JSC Russian Space Systems [Electronic resource], URL: https://ntsomz.ru/typhoon-impact-monitoring/, accessed: 09/04/2024.

16. Forecast of the main parameters of emergency situations in the territory of the Russian Federation in August 2023, outgoing No. M-116-2994 dated 08/01/2023, p. 6;

17. Operational daily forecast of emergency situations in the territory of the Russian Federation dated 08/07/2023, outgoing No. M-116-3067 dated 08/04/2023; 1

18. Forecast of natural and man-made emergencies on the territory of the Russian Federation for the period from August 4 to 14, 2023, outgoing No. M-116-3072 dated 04.08.2023;

19. Krohin V.V. Technology of short-term forecasts of tropical cyclones in the northwestern Pacific Ocean based on the regional model HWRF-Ru / Krohin V.V., Fil A.Yu., Evdokimova L.I., Moiseev M.B., Kotovich N.G. // Hydrometeorological research and forecasts. 2018. No. 4 (370). P. 74-87;

20. Krohin V.V. Hydrodynamic numerical regional weather forecast, model WRF-NMM / DVNIGMI, [electronic resource], URL: http://ferhri.org/napravleniya-rabot/2017-07-27-23-01-33/2017-07-27-23-43-05/121-gidrodinamicheskij-chislennyj-regionalnyj-prognoz-pogody-model-wrf-nmm-otv. Date of access 09/04/2024.

21.Annual Tropical Cyclone Report (Report). Pearl Harbor, Hawaii: United States Navy/Air Force Joint Typhoon Warning Center, June 2023. URL: https://www. ncei.noaa.gov/access/monitoring/ monthly-report/tropical-cyclones/203123, accessed: 27.05.2025.

22. Climate Monitoring and Prediction Section (CLIMPS) in Climatology and Agrometeorology Division https://pubfiles.pagasa.dost.gov.ph/pagasaweb/files/climate/ seasonalclimateoutlook/Seasonal Outlook_Jan_June 2023_OS.pdf, position: 13.01.2023, accessed: 01.06.2025;

23. Veryatin V.Yu. Comprehensive monitoring of tropical cyclones affecting the Far Eastern regions of Russia / Dissertation for the degree of candidate of geographical sciences. M., FGBU "NITs" PLANETA ", 2020, p. 9;

24.Kibalchich I. FAQ [frequently asked questions] about tropical cyclones (hurricanes, typhoons) // [Electronic resource] URL: http://meteoweb.ru/2010/phen072.php, Odessa, 2010, , accessed: 05/15/2025;

25.State report "On the state of protection of the population and territories of the Russian Federation from emergency situations of natural and man-made nature in 2023" // EMERCOM of Russia, Moscow, 2024. URL: https://mchs.gov.ru/uploads/document/24-04-10/71615f0595c3312c96d9a6e77826f9ab.pdf, accessed 05/25/2025, section 2, p. 42

科学出版物

上合组织国家的科学研究：协同和一体化

国际科学大会的材料

2025年6月4日，中国北京

编辑A.A.Siliverstova
校正A.I.尼古拉耶夫

2025年6月4日，中国北京
USL。沸点：98.7。 订单253.流通500份。

在编辑和出版中心印制
无限出版社