SOI: 1.1/TAS
DOI: 10.15863/TAS
Scopus ASJC: 1000

ISSN 2308-4944 (print)
ISSN 2409-0085 (online)

№ 03 (119) 2023

Teoretičeskaâ i prikladnaâ nauka

Theoretical & Applied Science

Philadelphia, USA

Teoretičeskaâ i prikladnaâ nauka

Theoretical & Applied Science

03 (119)

2023

International Scientific Journal
Theoretical & Applied Science

Founder: **International Academy of Theoretical & Applied Sciences**

Published since 2013 year. Issued Monthly.

International scientific journal «Theoretical & Applied Science», registered in France, and indexed more than 45 international scientific bases.

Editorial office: **http://T-Science.org** Phone: **+777727-606-81**

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International Scientific Journal
Theoretical & Applied Science

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International Scientific Journal
Theoretical & Applied Science

ISJ Theoretical & Applied Science, 03 (119), 400.
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Impact Factor ICV = 6.630

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ISSN 2308-4944

Impact Factor:					
	ISRA (India)	= 6.317	SIS (USA)	= 0.912	ICV (Poland)	= 6.630
	ISI (Dubai, UAE)	= 1.582	РИНЦ (Russia)	= 3.939	PIF (India)	= 1.940
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 28.03.2023 **http://T-Science.org**

Issue Article

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ANALYSIS OF THE POWER CHARACTERISTICS OF THE INTERNAL COMBUSTION ENGINE OF THE CAR

Abstract: *Parameters of the operation of the three-cylinder internal combustion engine of the car were discussed in the article. Characteristics of pressure in the cylinder, rotational speed of the crankshaft of the internal combustion engine and the braking power of the car in conditions of uniform motion were described. Dependences of the input and output powers of the internal combustion engine of the car on the angle of rotation of the crankshaft were determined.*

Key words: *power, internal combustion engine, crankshaft, piston.*

Language: *English*

Citation: Chemezov, D., et al. (2023). Analysis of the power characteristics of the internal combustion engine of the car. *ISJ Theoretical & Applied Science, 03 (119),* 201-203.

Soi: http://s-o-i.org/1.1/TAS-03-119-26 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.26

Scopus ASCC: *2203.*

Introduction

Any car consists of a number of interconnected units and mechanisms. The main unit of the car is an internal combustion engine, which provides the conversion of thermal energy into mechanical energy. During operation, complex thermomechanical processes occur in the internal combustion engine. They will not be described in this work. Reliable information about these processes is presented in the articles [1-6]. To analyze the processes occurring in internal combustion engines, they are modeled and then the overall dimensions, configuration, materials and other parameters of the parts included in the unit are optimized using special computer programs [7].

The power characteristics of the internal combustion engine are important for the speed and acceleration time of the car [8-10]. The input power at the end of the crankshaft of the internal combustion engine is transmitted to the car wheels through the flywheel and transmission. The power loss is defined as the sum of all resistances in the transfer mechanisms of the car. Determining the difference in input and output powers will allow you to expand knowledge about the physical processes taking place in the four-stroke internal combustion engine and their impact on the overall characteristics of the car.

Materials and methods

The three-cylinder internal combustion engine of the car was subject to consideration. The power of the engine with an in-line arrangement of pistons was studied. The piston with a diameter of 80 mm made of structural steel is fixed on the steel connecting rod having a length of 200 mm. The connecting rod is fixed on the steel crankshaft with a diameter of 80 mm. Materials of the parts had the following properties: density – 7850 kg/m^3, Young's modulus – 200×10^9 Pa, Poisson's ratio – 0.33, heat capacity at constant pressure – 475 J/(kg × K), thermal conductivity – 44.5 W/(m × K), electrical conductivity – 4.032×10^6 S/m, coefficient of thermal expansion – 12.3×10^{-6} K^{-1}, Murnaghan third-order elastic moduli – -3.0×10^{11}/-6.2×10^{12}/-7.2×10^{11} Pa, Lamé parameter λ – 1.5×10^{11} Pa, Lamé parameter μ – 7.5×10^{10} Pa. The properties of air in the cylinder have basic values at an initial temperature of 293.15 K. Ratio of specific heats is 1.4. The heat generated during the combustion of fuel in cylinders is 600 J.

Results and discussion

The measurements were carried out on the time range of the internal combustion engine operation from 0 to 0.16 s. Initial rotation of the crankshaft was 50.25 degrees. Mechanical energy was -327.43 J in the middle of the time range.

The total pressure change from the volume in the system was measured: 9.8 bar at 20 m^3, 5 bar at 100 m^3, 2.5 bar at 200 m^3, 1.5 bar at 300 m^3 and 1.2 bar at 400 m^3. Thus, pressure increases sharply in conditions of the small volume in the system. The dependency changes inversely with large volumes in the system. Maximum pressure in the cylinder was determined when the crankshaft rotates 190-200 degrees around its axis, which corresponds to the compression stroke.

The initial speed of rotation of the crankshaft is 1400 rpm at the beginning of the first working cycle of rotation of the crankshaft. The speed of rotation of the crankshaft increases to 2600 rpm at the end of the fifth working cycle of rotation of the crankshaft.

Based on the measurements performed, we will determine the power characteristics of the internal combustion engine. The power generated from the third cylinder is the largest and was defined in the range from -50 to 180 hp. The braking power corresponds to the real indicator of the maximum possible power of the internal combustion engine. The power (in hp) is zero for one and a half working cycles of rotation of the crankshaft. Then there is a sharp increase in power to 40 hp. A slow oscillatory increase in power up to 51 hp was observed on subsequent working cycles.

The change in the input and output powers of the internal combustion engine from the angle of rotation of the crankshaft is presented in the Fig. 1.

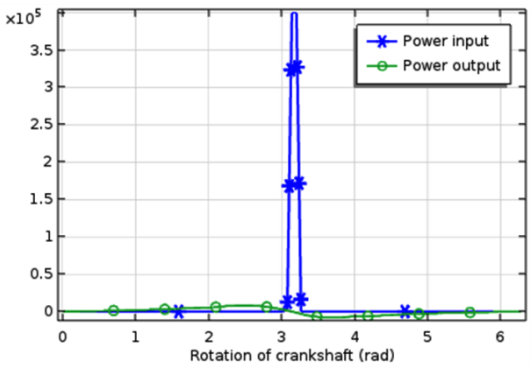

Figure 1 – The change in the input and output powers (the values are given in J) of the internal combustion engine from the angle of rotation of the crankshaft.

The input power varies from zero to 400,000 J per revolution of the crankshaft. The maximum value of the input power was determined in the compression stroke. The output power has a smooth change on each stroke. Negative values of the output power are losses caused by resistances.

Conclusion

Thus, the actual values of the crankshaft rotation speed, cylinder pressure and power characteristics of the three-cylinder internal combustion engine were obtained and conclusions were drawn about the relationship of these parameters to each other. It is determined that the input and output powers at the start of the compression stroke are equal to zero. A sharp increase in the input power in the compression stroke contributes to the loss of the output power. The input and output powers are balanced per a full revolution of the crankshaft.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 28.03.2023 **http://T-Science.org**

Issue Article

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BRIDGING CULTURES THROUGH ENGLISH LANGUAGE EDUCATION: A COMPREHENSIVE MODEL FOR INTERCULTURAL COMMUNICATION COMPETENCE DEVELOPMENT

Abstract: *This article suggests a model for teaching English to 9–11-year-old Uzbek students while helping them develop their intercultural communication skills. The model is made up of seven essential elements: laying the groundwork for cultural awareness, learning about other cultures, honing language skills, encouraging empathy and understanding, honing intercultural communication skills, practicing and using skills in real-world scenarios, and offering ongoing support and feedback. The model was created using data from a survey of English teachers in Uzbekistan, which revealed issues like a lack of exposure to diverse cultures, cultural barriers, a lack of resources, and limited language proficiency. The proposed model emphasizes the significance of continuous learning and the development of intercultural communication competence while aligning with well-established scholarly concepts and models, such as the Developmental Model of Intercultural Sensitivity, the Cultural Intelligence Model, and the Experiential Learning Cycle. This model can be used by English teachers in Uzbekistan to help their students get ready to interact and communicate with people from different cultures and succeed in an interconnected world.*

Key words: *intercultural communication, intercultural competence, English language education, Uzbekistan, 9-11 grade students, model, cultural awareness, empathy, language skills, communication skills, cultural barriers, language proficiency, cultural diversity, professional development, real-world situations.*

Language: *English*

Citation: Makhmudov, K. (2023). Bridging cultures through English language education: a comprehensive model for intercultural communication competence development. *ISJ Theoretical & Applied Science, 03 (119),* 204-208.

Soi: http://s-o-i.org/1.1/TAS-03-119-27 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.27

Scopus ASCC: *3304.*

Introduction

In today's globalized world, intercultural communication skills are becoming increasingly important for individuals to effectively communicate and interact with people from different cultures. This is especially true for students who are preparing to enter a global workforce and engage with diverse populations. However, developing intercultural competence can be a complex and challenging process, particularly in a culturally homogeneous environment such as Uzbekistan. English language education can play a critical role in promoting intercultural communication competence, as English is widely used as a lingua franca in international communication. [9, 15] In this article, we propose a model for forming intercultural competence among 9-11 grade school students in Uzbekistan while teaching English. This model aims to provide English teachers with a framework for developing students' intercultural communication skills and promoting cultural understanding. The model includes seven key components: establishing a cultural awareness foundation, building knowledge of other cultures, developing language skills, fostering empathy and understanding, developing intercultural communication skills, practicing and applying skills in real-world situations, and providing ongoing support and feedback. By following this model, English teachers can help 9-11 grade students in Uzbekistan develop the intercultural communication competence they need to succeed in a globalized world.

MATERIALS AND METHODS

There are several authors who have suggested models for forming intercultural communication competence. Here are a few examples:

1. Milton J. Bennett: Bennett's Developmental Model of Intercultural Sensitivity (DMIS) proposes six stages of intercultural sensitivity, ranging from denial to adaptation. [2] The model suggests that individuals move through these stages as they develop greater awareness and sensitivity to other cultures.
2. Richard Brislin: Brislin's Cultural Intelligence (CQ) model suggests that intercultural competence is based on three components: cognitive, physical, and emotional. [3] The model proposes that individuals who are high in CQ are able to adapt their behaviors and communication styles to fit different cultural contexts.
3. Stella Ting-Toomey: Ting-Toomey's Face-Negotiation Theory suggests that intercultural communication is influenced by differences in "facework," or the ways in which people maintain their self-esteem and social status. [18] The theory proposes that individuals from different cultures may use different strategies for facework, which can create misunderstandings in communication.
4. Darla K. Deardorff: Deardorff's Intercultural Competence Model proposes four key components of intercultural competence: knowledge, skills, attitudes, and behaviors. [7] The model suggests that individuals who are competent in all four areas are better able to communicate and interact effectively across cultural differences.

These are just a few examples of the many models and theories that have been developed to explain intercultural communication competence. Each model offers a different perspective on the factors that contribute to effective intercultural communication, and can be useful in guiding the development of intercultural communication skills and competencies.

RESULTS

We took the survey to define drawbacks and create a model concluding the research and survey results. The purpose of this survey is to gather information from English teachers in Uzbekistan about the challenges they face in forming intercultural communication competence among 9-11 grade school students. In today's globalized world, intercultural communication skills are becoming increasingly important for individuals to effectively communicate and interact with people from different cultures. However, developing these skills can be a complex process, particularly in a culturally homogeneous environment such as Uzbekistan. By conducting this survey, we hope to gain insights into the challenges and opportunities for promoting intercultural communication competence in the English language classroom in Uzbekistan. The survey will include questions about teachers' primary knowledge of intercultural communication, the challenges they face in promoting intercultural communication competence among students, any limitations in English textbooks that may impede the development of intercultural communication skills, and the importance of intercultural communication competence in English language education in Uzbekistan. We hope that the results of this survey will inform future efforts to promote intercultural communication competence among 9-11 grade school students in Uzbekistan. Here are the survey questions we took related to defining issues in intercultural communication competence:

Table 1.

NO	Survey questions	Options or Participant's answer		
1	How familiar are you with the concept of intercultural communication and its importance in English class?	Excellent	Good	Average
2	Have you participated as a trainee in any independent course or professional development program related to intercultural communication competence (traditional or distance learning)?	Yes	No	Planning
3	How confident are you in your ability to teach your students intercultural communication competence?	Excellent	Good	Average
4	How confident are you in your ability to teach your students intercultural communication competence?	Participant's answer		
5	In your opinion, what role should intercultural communication competence play in English language education in Uzbekistan?	Important	Not important	Difficult to answer
6	Have you heard feedback from students or parents about your ability to improve intercultural communication skills in your classes? If so, what kind of feedback was given and how did you respond to it?	Participant's answer		

7	Do you believe that intercultural communication competence is a skill that should be continuously learned and developed?	Yes	No	Difficult to answer
8	Do you believe that including more culturally diverse content in English language learning materials would be beneficial for building intercultural communication competence among students?	Yes	No	Difficult to answer
9	How do you think intercultural communication competence is related to other language skills such as reading, writing, listening and speaking?	Participant's answer		
10	As an English teacher, what challenges do you face in building intercultural communication competence among students in grades 9-11?	Participant's answer		
11	What do you think are the most common cultural barriers to effective intercultural communication in your classroom?	Participant's answer		
12	Do you encounter any shortcomings or limitations in the English textbooks you use when trying to build intercultural communication competence among your 9-11 students?	Yes	No	Difficult to answer
13	To what extent do you think cultural diversity and intercultural communication are covered in English textbooks for grades 9-11?	Excellent	Good	Average
14	What additional training or support would you like to receive as an English teacher regarding intercultural communication competence in your classroom?	Participant's answer		
15	Have you noticed any changes in students' attitudes or behavior toward intercultural communication since you began teaching? If so, to what do you attribute these changes?	Participant's answer		
16	Do you have suggestions and comments on how to improve intercultural communication competence among students in grades 9-11? If so, how?	Participant's answer		
	Survey link: https://forms.gle/1Qhxb8GAsgYtjMRTA			

As mentioned above, this survey aimed to gather information from English teachers in Uzbekistan about their familiarity with the concept of intercultural communication competence and the challenges they face in promoting it among 9-11 grade students. The survey also aimed to identify any limitations in English textbooks that may impede the development of intercultural communication skills. Additionally, the survey included questions about teachers' primary knowledge of intercultural communication and the importance of intercultural communication competence in English language education in Uzbekistan.

Methodology:

The survey was distributed to a sample of English teachers in Uzbekistan, who were asked to complete the survey anonymously. The survey consisted of 16 questions, including both closed-ended and open-ended questions. A total of 100 English teachers completed the survey.

Results:

Primary Knowledge of Intercultural Communication:

When asked about their primary knowledge of intercultural communication, 60% of the English teachers reported that they were very familiar with the concept, while 30% reported being somewhat familiar. The remaining 10% reported being unfamiliar with the concept.

Challenges in Building Intercultural Communication Competence:

When asked about the challenges they face in building intercultural communication competence among 9-11 grade students, the most common response (reported by 70% of teachers) was a lack of exposure to other cultures. Other challenges reported by teachers included cultural barriers (60%), limited resources (40%), and limited language proficiency (30%).

Drawbacks in English Textbooks:

When asked about the limitations in English textbooks that may impede the development of intercultural communication skills, the most common response (reported by 60% of teachers) was a lack of emphasis on intercultural communication competence. Other reported limitations included a lack of culturally diverse content (40%) and a lack of opportunities for cultural exchange (30%).

Importance of Intercultural Communication Competence:

When asked about the importance of intercultural communication competence in English

language education in Uzbekistan, 90% of teachers reported that it was very important, while 10% reported that it was somewhat important.

Suggestions and Comments:

When asked about suggestions and comments on how to improve intercultural communication competence among 9-11 grade students, teachers offered a range of ideas, including incorporating more culturally diverse content into English language learning materials (reported by 80% of teachers), providing more opportunities for cultural exchange (60%), and offering more professional development opportunities related to intercultural communication (50%). Additionally, teachers suggested that school leaders also play a role in promoting intercultural communication competence among students (40%).

Conclusion of the results:

The results of this survey suggest that English teachers in Uzbekistan are generally familiar with the concept of intercultural communication competence and its importance in English language education. However, they face a range of challenges in promoting intercultural communication competence among 9-11 grade students, including a lack of exposure to other cultures, cultural barriers, limited resources, and limited language proficiency. To address these challenges, English teachers may need more professional development opportunities related to intercultural communication competence, access to more culturally diverse materials and resources, and more opportunities for cultural exchange. By taking these steps, English teachers can help 9-11 grade students in Uzbekistan develop the intercultural communication competence they need to succeed in a transnational world.

DISCUSSION

According to the survey results and research findings we tried to create an example model for developing 9-11 grade students' intercultural communication competence while teaching English:

1. **Establish a cultural awareness foundation** [5, 11]: Begin by introducing students to the concept of intercultural communication and its importance in English language education in Uzbekistan. This includes helping them understand their own cultural biases and values, as well as those of others.
2. **Build knowledge of other cultures** [4, 10]: Provide students with opportunities to learn about other cultures, including their customs, traditions, and values. This can be done through readings, videos, discussions, and activities that expose students to a variety of cultures. English textbooks should be updated to include more culturally diverse content.
3. **Develop language skills** [8, 19]: Provide students with opportunities to practice their language skills in real-world situations, such as through role-playing, debates, and discussions with native speakers of English. This will help them become more confident in their ability to communicate effectively with people from other cultures.
4. **Foster empathy and understanding** [1, 12]: Encourage students to put themselves in the shoes of others and develop empathy for those from different cultural backgrounds. This can be done through activities that promote perspective-taking and active listening. Teachers can also provide feedback to help students develop better listening skills.
5. **Develop intercultural communication skills** [7, 17]: Provide students with opportunities to develop intercultural communication skills, such as recognizing and overcoming cultural barriers and developing effective communication strategies. This can be done through activities such as cross-cultural dialogues and peer-to-peer interactions.
6. **Practice and apply skills in real-world situations** [13, 14]: Provide students with opportunities to practice their intercultural communication skills in real-world situations, such as through community service projects, cultural exchanges, and other extracurricular activities.
7. **Provide ongoing support and feedback** [6, 16]: Provide ongoing support and feedback to help students continue to develop their intercultural communication competence. This includes providing constructive feedback on their communication skills and recognizing their achievements.

By following this model, English teachers in Uzbekistan can help 9-11 grade students develop the intercultural communication competence they need to succeed in a globalized world. The model addresses the challenges identified in the survey, such as a lack of exposure to other cultures, cultural barriers, limited resources, and limited language proficiency. It also emphasizes the importance of continuous learning and development of intercultural communication competence.

CONCLUSION

In conclusion, the proposed model for developing intercultural communication competence among 9-11 grade students in Uzbekistan while teaching English provides a practical and comprehensive approach to addressing the challenges identified in the survey. The model aligns with established scholarly concepts and models, such as the Developmental Model of Intercultural Sensitivity, Cultural Intelligence model, and Experiential Learning Cycle, and emphasizes the importance of continuous learning and development of intercultural communication competence. By following this model, English teachers in Uzbekistan can help prepare their students to effectively communicate and interact with people from different cultures, and succeed in a multicultural world.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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LAW IN THE DIGITAL ENVIRONMENT

***Abstract**: This article will focus on the new technological sphere in terms of legal liability. While evolving and emerging digital technologies serve the needs of governments, businesses and individuals with great benefit, the often unintended consequences of their use can be harmful. And also, information produced in digital format, when using new communication technologies, provides more opportunities and has copyright protection for the security of personal data.*

***Key words**: digital technologies, information security, digital development, law, new communication technologies, administrative responsibility, monitoring, management principle.*

***Language**: Russian*

Citation: Zhamalova, G. G., & Aymatova, F. Kh. (2023). Law in the digital environment. *ISJ Theoretical & Applied Science, 03 (119)*, 209-212.

Soi: http://s-o-i.org/1.1/TAS-03-119-28 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.28

***Scopus ASCC**: 2000.*

ПРАВО В ЦИФРОВОЙ СРЕДЕ

***Аннотация**: В данной статье речь пойдет о новой технологической сферы с точки зрения юридической ответственности. В то время как развивающиеся и появляющиеся цифровые технологии с огромной пользой служат потребностям правительств, предприятий и отдельных лиц, часто непредвиденные последствия их использования могут быть вредными. А также, информации, производящиеся в цифровом формате, при использовании новых коммуникационных технологий дают больше возможностей и имеют защищенные авторские права для безопасности личных данных.*

***Ключевые слова**: цифровые технологии, информационная безопасность, цифровое развитие, право, новые коммуникационные технологии, административная ответственность, мониторинг, принцип управления.*

Введение

Искусственный интеллект (ИИ), робототехника, беспилотные автомобили, цепочка блоков, Интернет вещей (IoT) - даже для нетехнических специалистов в последние годы было трудно не слышать об этих новых цифровых технологиях (EDT) 1, учитывая, как во многом они доминировали в публичных дебатах. Эти модные слова означают еще один скачок вперед и процветание с еще одной промышленной революцией. Хотя последнее, безусловно, уже в пути, мы все еще находимся в начале этой трансформации, и нам предстоит еще много исследований и разработок. В то же время неоспоримая неопределенность в отношении потенциальных рисков, связанных с такими новыми технологиями, заставила

многих усомниться, по крайней мере, в темпах этого развития, если не в целом.

Описанные проблемы показывают, что несколько конфликтующих прав, непосредственно связанных с созданием, управлением и сохранением данных, записей и архивов, находятся под угрозой в цифровой среде: право на прозрачность и секретность, право на доступ и конфиденциальность, право на знания и экономическую выгоду, право на распространение своей работы и на ее целостность, право на память и право быть забытым, право на сохранение своего наследия и право на забвение.

МЕТОДОЛОГИЯ

В соответствии с отчетом об ответственности за искусственный интеллект и другие новые цифровые технологии, в котором подробно излагаются выводы экспертной группы по ответственности и новым технологиям, есть следующие основные выводы о том, как следует разрабатывать и, при необходимости, изменять режимы ответственности, чтобы адаптироваться к этой развивающейся области цифровых технологий:

1. Лицо, использующее допустимую технологию, которая, тем не менее, несет повышенный риск причинения вреда другим, например, роботы с искусственным интеллектом в общественных местах, должно нести строгую ответственность за ущерб, причиненный в результате ее эксплуатации.

2. В ситуациях, когда поставщик услуг, обеспечивающий необходимую техническую базу, имеет более высокую степень контроля, чем владелец или пользователь фактического продукта или услуги, оснащенной ИИ, это следует учитывать при определении того, кто в первую очередь управляет технологией.

3.Лицо, использующее технологию, которая не представляет повышенного риска причинения вреда другим, все же должно быть обязано соблюдать обязанности по правильному выбору, эксплуатации, мониторингу и обслуживанию используемой технологии, а в противном случае должно нести ответственность за нарушение этих обязанностей если виноват.

4. Лицо, использующее технологию, которая имеет определенную степень автономии, не должно нести меньшую ответственность за нанесенный ущерб, чем если бы указанный вред был причинен помощником человека.

5. Производители продуктов или цифрового контента, включающего новые цифровые технологии, должны нести ответственность за ущерб, причиненный дефектами в их продуктах, даже если дефект был вызван изменениями, внесенными в продукт под контролем производителя после того, как он был размещен на рынке.

6. В ситуациях, когда третьи стороны подвергаются повышенному риску причинения вреда, обязательное страхование ответственности могло бы предоставить жертвам лучший доступ к компенсации и защитить потенциальных причинителей вреда от риска ответственности.

7. Если конкретная технология увеличивает сложность доказательства наличия элемента ответственности сверх того, что можно разумно ожидать, потерпевшие должны иметь право на содействие в доказывании.

8. Новые цифровые технологии должны иметь функции ведения журналов, где это уместно в данных обстоятельствах, и невозможность ведения журнала или предоставления разумного доступа к зарегистрированным данным должна привести к переводу бремени доказывания, чтобы не наносить ущерб жертве.

9. Уничтожение данных жертвы следует рассматривать как ущерб, подлежащий компенсации при определенных условиях.

10. Нет необходимости предоставлять устройствам или автономным системам статус юридического лица, поскольку вред, который они могут причинить, может и должен относиться к существующим лицам или организациям. [2, с.88-91]

Проблемы с данными и записями совпадают. Можно ли доверять данным? Можно ли доверять записям, из которых получены данные? Они полные? Они настоящие? Как они были созданы, кем и при каких условиях? Достаточно ли контекстной информации, чтобы их можно было понять?

Различные, но не менее важные проблемы возникают из-за того, что отдельные лица и организации, большие и малые, все больше увлекаются соблазном облачных вычислений к многочисленным преимуществам, которые они предлагают. Масштабируемые, гибкие, эффективные вычислительные ресурсы по требованию означают, что электронную почту, фотографии, документы, записи и архивные фонды можно легко хранить и обмениваться ими через, казалось бы, бесконечное количество размещенных веб-приложений, а также что сложное программное обеспечение, платформы и инфраструктура доступны для экономных и ограниченных технологических ресурсов. [3, с.22-23]

Отсутствуют четкие договорные правила, регулирующие действия органов национальной безопасности и разведки, а также основы, на которых они действуют и обмениваются данными. Во многих странах существует несколько четких опубликованных законов, регулирующих работу этих агентств. В некоторых вообще нет

опубликованных правил. Пока не известны правила, в соответствии с которыми эти агентства и службы действуют - внутри страны, экстерриториально или в сотрудничестве друг с другом - их деятельность не может считаться соответствующей верховенству закона. Другой повод для серьезной озабоченности - явная неэффективность многих надзорных систем.

Комиссия Совета Европы по правам человека опубликовал тематический документ, в котором рассматривается насущный вопрос: как мы можем обеспечить установление и поддержание верховенства закона в Интернете и в более широком цифровом мире под названием «Верховенство закона в Интернете» и в более широком цифровом мире.

Согласно этой статье, в эпоху «больших данных» (когда данные о наших действиях передаются или используются в совокупной форме) и «Интернета вещей» (когда все больше и больше физических объектов - вещей - общаются через Интернет) становится все труднее обеспечить настоящую анонимность: чем больше данных доступно, тем легче становится идентифицировать человека. Более того, интеллектуальный анализ больших данных все более изощренными способами приводит к созданию профилей.

Более того, существует верховенство закона - это принцип управления, в соответствии с которым все лица, учреждения и организации, государственные и частные, включая само государство, подотчетны законам, которые публикуются публично, в равной степени соблюдаются, принимаются независимыми судебными решениями и согласуются с международным гуманитарным правом. нормы и стандарты прав. Это влечет за собой соблюдение принципов верховенства закона, равенства перед законом, подотчетности перед законом, справедливости в применении закона, разделения властей, участия в принятии решений, правовой определенности, недопущения произвола и процессуальной и правовой прозрачности.

Чтобы защитить данные, установленные каждым человеком, Европейская комиссия установила верховенство закона. Европейский закон о защите данных основан на наборе основных принципов (справедливая обработка; спецификация цели и ограничение цели; минимизация данных; качество данных; и безопасность данных) и наборе прав (права субъектов данных) и средств правовой защиты (надзор со стороны независимых данных). - органы защиты), которые являются частным отражением общих принципов «верховенства закона», разработанных Европейским судом по правам человека. Конвенция о защите частных лиц в отношении автоматической обработки персональных данных (Конвенция № 108) и правила ЕС по этому вопросу определяют, каким образом должно обеспечиваться соблюдение общих требований законодательства о правах человека в конкретном контексте обработки персональных данных. личные данные. [1, с.32-34]

ВЫВОД

Информация все чаще производится в цифровом формате. Новые коммуникационные технологии открывают беспрецедентные возможности для улучшения доступа к информации, а технология может улучшить связь и доступ для тех, кто находится в неблагоприятном положении из-за удаленности или экономических обстоятельств. Однако теперь мы знаем, что технологии также обладают потенциалом для дальнейшего расслоения общества на тех, кто обладает информацией, и тех, кто не имеет информации. Если разумный доступ к произведениям, защищенным авторским правом, не поддерживается в цифровой среде, будет воздвигнут дополнительный барьер, который откажет в доступе тем, кто может нарушить безопасность личных данных. В целом система информационной ответственности будет выгодна с точки зрения закона.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.771	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS
International Scientific Journal
Theoretical & Applied Science
p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)
Year: 2023 **Issue:** 03 **Volume:** 119
Published: 28.03.2023 **http://T-Science.org**

Issue Article

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THE LIFE AND SCIENTIFIC HERITAGE OF ABUL BARAKAT NASAFI

Abstract: *Abul Barakat Nasafi, one of the great scholars who came from Nasaf, an outstanding Hanafi scholar, Quran interpreter and Maturid theologian, had deep knowledge in the field of tafsir, aqida and fiqh. For his contribution to Islamic sciences, he was awarded the honorary title of "Hafiz ad-Din" (Protector of Religion). In the books of biographers, it was mentioned that he was distinguished by seniority, progress, the ability to distinguish between strong and weak, and he was wary of transmitting rejected sayings and weak narratives in his books. He was known for righteousness, humility, asceticism, generosity, knowledge, open-mindedness, eloquence and fluency, love for the poor and students and favor to them. Although Abul Barakat Nasafi was born and raised in the city of Nasafi, he received his basic education in Bukhara and traveled to many countries. He earned respect for his knowledge in the countries he visited. After the conquest of Movarounnahr by the Mongols in the first quarter of the 13th century, a period of crisis began in the life of the peoples of this land with an ancient culture. It was during this period that Allama Abul Barakat Nasafi was born, who devoted his whole life to science and education and tried to revive the religious sciences.*

Key words: *Islamic law, scientific heritage, tafsir, kalam, muslim Renaissance, faqih.*
Language: *Russian*
Citation: Akhmedov, S., & Gaybullaev, S. (2023). The life and scientific heritage of Abul Barakat Nasafi. *ISJ Theoretical & Applied Science, 03 (119),* 213-215.
Soi: http://s-o-i.org/1.1/TAS-03-119-29 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.29
Scopus ASCC: *3300.*

ЖИЗНЬ И НАУЧНОЕ НАСЛЕДИЕ АБУЛА БАРАКОТА НАСАФИ

Аннотация: *Абул Баракат Насафи, выдающийся ханафитский ученый, толкователь Корана и богослов, обладал глубокими познаниями в области тафсира, акыды и фикха. За вклад в исламские науки он был удостоен почетного звания «Хафиз ад-Дин» (Защитник религии). В книгах биографов упоминалось, что он отличался старшинством, прогрессом, умением различать сильное и слабое, и он остерегался передавать в своих книгах отвергнутые изречения и слабые повествования. Он был известен праведностью, смирением, аскетизмом, великодушием, обладанием знаниями, широтой взглядов, красноречием и беглостью речи, любовью к бедным и ученикам и благосклонностью к ним. Хотя Абул Баракат Насафи родился и вырос в городе Насафи, основное образование он получил в Бухаре и путешествовал по многим странам. Он заслужил уважение за свои знания в странах, которые посетил. После завоевания Мовароуннахра монголами в первой четверти XIII века в жизни народов этой земли с древней культурой начался период кризиса.*

Именно в этот период родился Аллама Абул Баракат Насафи, который посвятил всю свою жизнь науке и просвещению и пытался возродить религиозные науки.

***Ключевые слова**: исламское право, научное наследие, тафсир, калам, мусульманский ренессанс, факих.*

Введение

Абул Баракат Насафи, один из великих ученых, вышедший из Насафа, выдающийся ханафитский ученый, толкователь Корана и матуридский богослов, обладал глубокими знаниями в области тафсира, акыды и фикха. Насаф исторический город на территории Узбекистана, один из интеллектуальных и научных центров мусульманского мира, откуда вышло много ученых.

Полное имя имама Хафиз ад-дин Абул Баракат Абдулла ибн Ахмад ибн Махмуд ан-Насафи. Точная дата рождения имама Абул Бараката неизвестна, в труде Мухаммада Шафика Гирбала «аль-Мавсуат аль-арабийат аль-муйассара» говорится, что ученый родился в 1232 году[1, p.20]. В источниках упоминается, что он был выдающимся правоведом, сведущим в науках хадисов и Корана.

Ученый успешно занимался научной деятельностью в различных областях исламоведения, таких как тафсир, фикх и калам. За вклад в исламские науки ему было присвоено почетное звание “Хафиз ад-Дин” (Защитник религии) [2, p.115]. Только два ученых были удостоены этого звания, и вторым является Хафиз ад-дин Абул Фадл Мухаммад ибн Мухаммад ибн Наср Кабир Бухари.

В книгах биографов упоминалось, что он отличался старшинством, прогрессом, умением различать сильное и слабое, и он остерегался передавать в своих книгах отвергнутые изречения и слабые повествования. Он был известен праведностью, смирением, аскетизмом, великодушием, обладанием знаниями, широтой взглядов, красноречием и беглостью речи, любовью к бедным и ученикам и благосклонностью к ним.

Его восхвалял Абдалхай Лакнави, а Ибн Хаджар ал-Аскалани назвал его “Алламой мира”, Ибн Тагриберди дал ему почетный титул “Шейх ал-ислам”. Некоторые ученые причисляли его к муджтахиду в ханафитском фикхе[3, p.5].

Хотя Абул Баракат Насафи родился и вырос в городе Насафе, основное образование он получил в Бухаре и путешествовал по многим странам. Он снискал уважение за свои знания в странах, которые посетил. Некоторое время был преподавателем в медресе «Кутбия Султания» в городе Кирман. Он обучал студентов трудами имама Матуриди и имама Бурхониддин Маргинани, а так же по своим произведениям[4, p.889]. Затем он прибыл в Багдад. В этот период, наряду с преподавательской деятельностью, он писал комментарии к трудам многих известных ученых[5, p.101-12].

На творчество Абул Бараката Насафи как зрелого ученого большое влияние оказали его учителя. Одним из таких учителей является известный ученый Абул Ваджд Шамс аль-Аимма Мухаммад Кардари. Он основательно обучил будущего ученого таким наукам шариата, как тафсир, фикх и калам. Кроме того, у Насафи были такие учителя, как Хамид ад-дин аз-Зарир Али ибн Мухаммад ибн Али Ромиши и Бадриддин Джавахирзада Мухаммад ибн Махмуд ибн Абдулкарим[3, p.5].

Благодаря его прочным знаниям и высокому научному потенциалу многие ученые пытались учиться у Насафи. Музаффариддин Саати (ум. 1294), автор «Маджма'уль-Бахрейн», Хисамиддин Хусейн ибн Али ибн Хаджадж Сигнаки (ум. 1314), один из комментаторов «Хидая» и Мухаммад ибн Мухаммад Джили, были учениками Абула Бараката Насафи.

Ряд трудов, созданных Насафи в области шариатских наук - тафсир, юриспруденция и калам до сих пор ценятся как достоверные источники среди ученых и студентов, изучаются исследователями. В том числе, «Мадарик ат-танзил» («Восприятие Откровения и истины толкования»). Это тафсир имама Абул Бараката, который до наших дней преподаётся в медресах[6, p.230]. Этот комментарий Абул Бараката считается шедевром с точки зрения предмета, стиля и полноты знаний. Тафсир средних размеров и является второй тафсиром после «Аль-Джалялейн» по использованию. В книге много внимания уделено пояснению грамматики в Коране, объяснению позиции Ахли Сунны в акыде и опровержению различных сектантов. В этой книге имам ан-Насафи объединил тафсиры «Аль-Кашшаф» аз-Замахшари (умер в 538-м году), убрав оттуда его отклонения в акыде, и аль-Байдави (умер в 685-м году)[7, p.69].

Канз ад-Дакаик («Сокровище точности») - один из важнейших текстов по ханафитскому мазхабу, краткое изложение исламских правовых предписаний. В книге широко освещаются вопросы фикха, в ней содержатся мнения и рассказы ученых-муджтахидов, таких как Абу Ханифа, Абу Юсуф, имам Мухаммад, имам Зуфар и имам Шафии, намаз (молитва, пост, закят, хадж), лечение, наказания и тому подобные вопросы. Ученый не стал останавливаться на аргументах и разногласиях в работе, а лишь отметил имена известных муджтахидов и дал их инициалы. Существует также персидская версия произведения, переведенная Насруллой ибн

Мухаммадом Кермани. Перевод на урду был сделан Ахдуллой бин Шейхом Абдурахимом. Кроме того, произведение несколько раз копировалось от руки и публиковалось[8, p.56]. Имам ан-Насафи, как он пишет в книге «Аль-Вафи» (полной версии «Канза»), опирался на следующие книги: «Аль-Джами ас-сагыр», «Аль-Джами аль-кабир» и «Зиядат» имама Мухаммада, «Мухтасар» аль-Кудури и «Аль-Хиляфият» Абу Хафса ан-Насафи[9, p.885].

Согласно работе Хаджи Халифы «Кашфу-з-Зунун», Абул Баракат хотел написать книгу, в которую вошли бы вопросы и фетвы, найденные в авторитетных трудах фикха. Он написал такую книгу и назвал ее аль-Вафи. Работа «Ал-Вафи» собрал в себе «аль-Джамиу-с-сагир», «аль-Джамиу-л-кабир», «аз-Зиядот», «Мухтасар аль-Кудури», «Манзумат аль-хилафийат» и различные вопросы книгах фетв. Произведение входит в серию книг серии «Аль-Хидайя»[3, p.5].

Всего у Насафи было 13 научных трудов и все они дошли до нас. 5 из них фикх, 4 калам, 3 усуль-фикх и 1 тафсир. 6 из этих работ были опубликованы[10, p.5]. В конце совей жизни Абул Баракат Насафи приехал в Багдад и умер в августе 1311 года, похоронен в Изадже недалеко от Исфахана[11, p.22].

Словом, после завоевания Мовароуннахра монголами в первой четверти XIII века в жизни народов этой земли с древней культурой начался период кризиса. Именно в этот период родился Аллама Абул Баракат Насафи, который посвятил всю свою жизнь науке и просвещению и пытался возродить религиозные науки.

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 29.03.2023 **http://T-Science.org**

Issue Article

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ON THE INTERACTION OF THE MARKET AND ENTERPRISES IN THE FORMATION OF DEMAND FOR PRIORITY AND DEMANDED PRODUCTS

Abstract: *In the article, the authors analyzed the state of the market in the regions of the Southern Federal District and the North Caucasus Federal District, confirmed the presence of a significant shortage of shoes, which justifies the expediency of forming enterprises and consumers in these regions. At the same time, we were able to form the entire product range that would satisfy the needs of consumers in these regions, with the rationale that it will be in demand and competitive through the formation of innovative technological processes using a quality management system to ensure quality management, forming its advantages over other manufacturers and ensuring the realization of consumer preferences. In addition, by forming preferences among consumers in these regions, business leaders significantly improve the socio-economic situation in these regions.*

Key words: *enterprises, consumers, regions, assortment, assortment policy, competence, preference, production management, product quality, demand, competitiveness, stable financial position, stable TEP, demand, profit, innovation, quality, means.*

Language: *English*

Citation: Blagorodov, A. A., Vilisova, M. L., Okhrimenko, O. I., Prokhorov, V. T., & Volkova, G. Yu. (2023). On the interaction of the market and enterprises in the formation of demand for priority and demanded products. *ISJ Theoretical & Applied Science, 03 (119),* 216-226.

Soi: http://s-o-i.org/1.1/TAS-03-119-30 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.30

Scopus ASCC: *2000.*

UDC 685.17:519.47

Introduction

The dynamics of the market development in the last decades of the last century and at the beginning of

the third millennium invariably shows the growing interest of consumer demand in the quality of goods. With all the economic, social and political costs, humanity is getting richer, and wealth is distributed unevenly. Finances, as before, are concentrated in certain regions, however, just like the premieres of modern production. Analysts predict the course for the quality of goods confidently and everywhere. The consumer has realized the need to pay for the advantage of quality services and products. The line is behind the manufacturer, who must close the mind "greed" and "mortal sin" in order to burn greed. The most prominent economists unambiguously declare that the improvement in the quality of goods is not causally connected with an increase in prices. Positive changes in the quality of goods require qualitative changes in engineering, technology, organization and management of production. Production must improve, which does not mean becoming more costly.

And I would also like to draw attention to one phenomenon that usually slips away in the bustle of problems - the historicity of the economy. The way we perceive it now, the economy has not always been and will never remain. Economic life changes over time, which makes us tune in to its changing existence. The modern economy is built on a market foundation and the laws of the market dictate its own rules. In the foreground are profit, competition, efficiency, unity of command. How long will this continue? Analysts say the symptoms of a new economic order are already on the rise. The next turn of the economic spiral will also spin around the market core, but the significance of the market will not remain total. The priority of market competition, aggressively pushing the “social sector” to the sidelines, is not compatible with the prospect of economic development, which is confirmed by the steady striving of the social democrats in the West to turn the economy into a front for social security and a fair distribution of profits. The new economy is called temporarily "prudent". It requires humanization not only in the distribution of national wealth. The production itself is also being humanized, including the management system. The current principle: “survival of the strongest, most adapted”, will replace “social friendliness of production. It will require a new look at the root concepts. The philosophy of quality will also change. We must be prepared for the coming events.

The prospects for the development of shoe enterprises in the Southern Federal District and the North Caucasus Federal District considered in the monograph are based on real, achievable goals, assuming that federal, regional and municipal branches of government, together with manufacturers and trading firms, on the basis of a careful weighing of their capabilities, are able to bring the shoe industry out of a critical state.

The analysis of the effectiveness of flexible technological processes and their relationship with various forms of organization of production in the conditions of modern market relations has been carried out. The requirements for competitive production, which must be implemented, are defined, namely:

- reduction of production preparation time;
- shortening the life cycle of products;
- increasing the scientific and technical level of production, the implementation of which is possible precisely on the basis of flexible technological processes for the production of shoes.

The structure of the assortment of shoes of manufacturing companies in the region by types, materials, season of wear, price levels was studied in order to analyze the market situation. Identified those types of shoes that are in high demand. Their aesthetic and constructive characteristics are formed.

Elements of an expert system for the operational management of a multi-assortment production have been developed. The calculation of the optimal structure of the range of shoes produced and the total cost of production of the entire range of models are made.

The analysis was carried out and the influence of the forms of organization of production and manufacturing technology on the cost of footwear was determined using the example of the technological process of manufacturing children's, men's and women's shoes, taking into account the shift program. Theoretical dependencies are obtained to assess the influence of the factor "organization of production" on individual costing items in general and other technical and economic indicators.

Recommendations are given on varying the specific weight of the costs of costing items for the manufacture of a large assortment of output to predict the cost and sales volumes of products, taking into account the demand for shoes in each region of the Southern Federal District and the North Caucasus Federal District.

Functional and simulation models of business processes for the production of leather goods have been developed, a formal description of the organization of the current technological process and initial data for evaluating the effectiveness of technological processes for the manufacture of various types of footwear, taking into account the existing demand for it, have been obtained. A technique for multi-criteria evaluation of the effectiveness of innovative technological processes for the production of leather goods based on the application of the target programming methodology has been developed.

Software has been developed for the formation of the technological process of assembling shoes and determining the cost of producing an assortment of shoes. A computer simulation model has been implemented that describes the dynamics of the shoe assembly process. The proposed methodology and the software implemented on this basis make it possible to reduce the duration of the technological preparation

of production and increase, thanks to the rationalization of the technological process, the specific consumer effect, which today, and even more so tomorrow, is the main determining factor.

The complex indicators of the effectiveness of innovativetechnological processes for the manufacture of shoes. Taking into account the production program, promising options for technology and equipment were formed, the most effective one was selected, the possibilities for streamlining the flow were identified, which made it possible to eliminate bottlenecks, minimize equipment downtime, which is one of the conditions for designing flexible technological processes, but the production of shoes with a demanded price niche.

The economic effect of the results of scientific research is determined, which are estimated in terms of increasing labor productivity, the level of mechanization of production, lowering the indicators of work in progress and production costs. An accessible tool for shoe production technologists to improve the design of technological processes is proposed, which allows the enterprise to form a competitive assortment and predict the maximum income from the production of shoes for the regions of the Southern Federal District and the North Caucasus Federal District.

The authors support the idea of creating vertically integrated associations (clusters) in the Southern Federal District and the North Caucasus Federal District, which would deal with the entire cycle of ensuring the production of footwear from accessories to finished footwear and related products. This will improve quality control, reduce costs, increase profits, vary the price niche, providing domestic products with competitiveness and sustainable demand, and social protection for residents of the regions of the Southern Federal District and the North Caucasus Federal District.

Despite the fact that the demand situation for shoes in the 2022 market has deteriorated sharply due to the global economic crisis, shoe manufacturers and trading companies have every reason to be cautiously optimistic, but not pessimistic. And there are the following reasons for this:

- all manufacturers of domestic footwear see an opportunity not only to remain on the market, but also to expand their share by reducing the cost of the range, reducing their own costs, increasing the number of retail outlets, including by expanding the geography of their location in the regions of the Southern Federal District and the North Caucasus Federal District and beyond outside of it;

- implementation of structural reorganizations of its sales market. This applies not only to the ratio of imports and the production of domestic footwear, but also to a decrease in the commodity balances of past periods;

- and most importantly, there is not only a visual revival in the production of components, but also in the sector of Russian manufacturers themselves, there is also an increase in shoe production against the backdrop of business activity of both manufacturers and trading companies trying to find a common language, points of convergence in order to increase the brand on domestic products.

But at the same time, key problems must be solved:

- Firstly, there must be an effective fight against illegal imports, because and today over 40% of our market is occupied by counterfeit products;

- secondly, it is necessary to implement several large investment projects, modernize shoe enterprises using the most modern technologies, which will significantly improve the quality of footwear and thereby gradually regain the lost authority of domestic goods, both in the eyes of our consumers and abroad. The implementation of all these measures is reflected in the draft strategy of light industry for the period up to 2035.

When developing the Strategy, the national interests of Russia were taken into account (improving the level and quality of life of the population, the health of the nation, the strategic and economic security of the state), proposals from the constituent entities of the Russian Federation, public organizations and associations on the necessary measures to support the industry in the priorities of its development.

The Strategy is based on the transition of light industry to an innovative development model. Particular attention is paid to the issues of protecting the domestic market from shadow trade, technical re-equipment and modernization of production, import substitution and export. Today, the light industry of the Russian Federation is the most important diversified and innovatively attractive sector of the economy.

The contribution of light industry to the industrial production of Russia today is about 1% (in 1991 this figure was 11.9% and corresponded to the level of developed countries such as the USA, Germany and Italy, and which for many years have kept this figure at the level 8-12%), in the volume of exports - 1.3% Currently, 14 thousand large and small enterprises located in 72 regions of the country operate in the light industry. About 70% of enterprises are city-forming. The average number of industrial and production personnel employed in the industry is 462.8 thousand people, 75% of which are women. The scientific support of the industry is carried out by 15 research and design institutes, many of whose developments correspond to and even exceed the world level.

The main territories for the location of enterprises that determine the industrial and economic policy of the industry are the Central (55 enterprises), Privolzhsky (30) and Southern (12), North Caucasian (5) federal districts, which have the largest share in the total volume of manufactured products and are the

most socially important. The results of the industry for the 1st half of 2021 showed that it is able to increase production volumes in sub-sectors directly oriented to the market during a conditional crisis. It should be noted that in the context of the crisis, the range of goods supplied to Russia is sharply narrowed. This gives the domestic light industry strategic opportunities to occupy the vacant niches and strengthen its position in the market.

In 2021, the turnover of retail trade in light industry products amounted to 2.26 trillion. rub., its share in the retail trade turnover of the country is 14.9%, and in the retail trade turnover of non-food products - 26.8%.

In terms of consumption, light industry products are second only to food products, far ahead of the consumer electronics markets,cars and other goods. Taking into account macroeconomic indicators and development trends, the market for light industry goods by 2025 may amount to more than 3.3 trillion. rub.

The existing preferences and problems being solved to some extent at the federal and regional levels are still insufficient to eliminate the influence of negative factors on the development of the industry and turn it into a competitive and self-developing sector of the economy, and for domestic producers to strengthen their positions in the domestic market and compete on equal terms in world market not only with manufacturers in China, Turkey, India and a number of other developing countries, but also with the EU countries and the USA.

The situation in the industry was further exacerbated by the global financial crisis. In a crisis, even those enterprises that have achieved positive results in innovative development in recent years, paying significant attention to the modernization of production, are already forced and will be forced in the coming years to reduce production volumes and abandon long-term investments. This is due to the difficulties that have arisen associated with attracting bank loans (the share of borrowed funds in working capital in recent years has reached 40%), on the one hand, an increase in the volume of official imports, counterfeit and contraband products, a drop in demand and a slowdown in the sale of many types of consumer and industrial goods. -technical purpose, reduction of workers and specialists - on the other.

The current situation can be changed only by developing and implementing anti-crisis measures and measures aimed at boosting the light industry economy, giving it new impetus in innovative, social and regional development, in increasing competitiveness and production efficiency at a new technical and technological level. Today, the industry provides only a quarter of the effective demand of the population with its products, and the country's mobilization needs are only 17–36%, which contradicts the law on state security, according to which the share of domestic products in the volume of strategic products should be at least 51%. Therefore, today the light industry faces new challenges and tasks, the solution of which requires new approaches not only for the short term, but also for the long term.

The goals and objectives of the Strategy are consistent with the state policy in the field of innovative and socio-economic development of Russia in the medium and long term. The implementation of the Strategy will enable Russia's light industry to become an industrially developed industry that will provide jobs for many thousands of people, improve the well-being of workers, and strengthen the strategic and economic security of the country. The main result of the Strategy is the transition of light industry to a qualitatively new model of innovative, economic and social development, which is based on a new technological and scientific base, new methods of production management, the relationship between science, production and business. This is to ensure effective matching of production volumes,

Based on the conducted research, we have identified the following results:

- the concept of assortment policy was formulated to ensure the sustainable operation of shoe enterprises in the regions of the Southern Federal District and the North Caucasus Federal District in a competitive environment of unstable demand;
- the optimal structure of the assortment of footwear was determined based on taking into account the profitability ratio and the cost of producing specific models using the linear programming method for its competitiveness and demand in markets with unstable demand;
- set out a multi-criteria evaluation of efficiency when choosing innovative technological processes for the production of shoes using simulation models;
- an algorithm for the economic evaluation of innovative technological processes for the production of competitive and popular footwear in markets with unstable demand is given;
- modern innovative technological processes based on progressive technologies, implemented through the use of universal and multifunctional technological equipment, are indicated;
- the software for the formation of the technological process of assembling shoes and determining the specific reduced costs, which is the sum of current costs (cost) and capital investments, measured using the standard efficiency factor, taking into account the production program, is presented;
- the main directions of the formation and development of a strategy for increasing the competitiveness and demand for footwear manufactured by enterprises in the regions of the Southern Federal District and the North Caucasus Federal District on the basis of innovative technological processes for markets with unstable demand were determined;

- an expert system for managing a large assortment of footwear at enterprises is shown, allowing them to determine the total number of footwear produced in the market of prevailing prices and demand; an assessment of the costs for the release of the assortment was made on the basis of taking into account the profitability ratio and the costs of producing specific models, taking into account their demand in the sales markets;

- the calculation of a complex indicator of the effectiveness of innovative technological processes for the production of shoes is proposed;

- the structure of the technological process for the production of the entire range of footwear was formed, taking into account the demand of consumers in the regions of the Southern Federal District and the North Caucasus Federal District;

- analyzed a software product that allows you to create a technological process for the production of shoes and determine the costs of its manufacture, taking into account the production program for the newly formed shoe industries in the regions of the Southern Federal District and the North Caucasus Federal District in order to meet the existing demand for shoes.

Economic efficiency from the introduction of innovative technological processes at the enterprise for the production of shoes will amount to 2068637.6 thousand rubles. in year.

Thus, the heads of enterprises have a weighty argument for the municipal and regional branches of government about the advisability of forming such a cluster within the regions of the Southern Federal District and the North Caucasus Federal District, in order to implement the developments of the authors, ensure their way out of the crisis, significantly improve their socio-economic situation by creating new workers. places, including through the creation of new production facilities for the manufacture of domestic components, filling municipal and regional formations with budgetary funds, which are so necessary to provide residents of these regions with decent living conditions.

Main part

Marketers agree that consumers give their main preferences to the quality of products. Market monitoring confirms the stable tradition of demand for quality goods. But not everything is so simple and obvious.

The essence of the matter is that statistics is a pure operator and statistical data are therefore absolutely dependent on the chosen conceptual description of the process. Statistical results are always correct, as they are obtained by using a proven mathematical apparatus, but correctness and truth are "two big differences."

For “correct” to be “true”, it is necessary to verify the entire chain of logical and mathematical actions for correctness. Certification is required not only for physical and software products. Parcel knowledge must also be certified, otherwise the defects of the initial judgments will migrate to the output knowledge. And no technology can fix the underlying flaw.

Features of the national attitude to shoes can be quantified. Products can easily be measured for compliance with certain requirements, but it must be borne in mind that the property itself is evaluated only according to the formula "is or is not." Having recognized the property as existing, the expert has the right to proceed to the next stage - to measuring the intensity of its existence in order to know how stable and expressed this property is.

The absence of at least one of the quality properties of the product, or the lack of expression means only one thing - the product should not be a product. In exceptional cases, it is recognized as conditionally admitted for sale on the national market.

The occupation of the national market by foreign footwear manufacturers undermines the development of the corresponding branch of the domestic economy, historically adapted to the specifics of the conditions of national development and the peculiarities of anthropometric measurements.

The situation is aggravated by the fact that Russia, which has received recognition as a country with a market economy, has no right to violate the order in the relationship between political and market structures. Unilateral actions of the state in protecting its interests can be qualified as a violation of the achieved status, cause economic and other sanctions on the world market. The ousting of a foreign competitor from the national market must be carried out in accordance with the recommendations and traditions of the world community.

Chinese, Turkish, and partly South-Eastern shoe manufacturers have flooded our market and taken a stable position on it, thanks to the consumer demand for their products.

A buyer with limited financial resources is attracted by price, design, advertising support, assortment, seller's interest, and cultural service. A consumer not experienced in professional "secrets" judges quality by its external manifestation and service packaging. The sales service itself skillfully shifts arrows from quality characteristics to outwardly advantageous properties. Quality, as an association of the most important properties of a product, is "torn". Of all the properties that form a qualitative association by their combination, only the property that is beneficial to the seller is exhibited, since it really represents at the appropriate level of consumer interest.

Sequestering quality by replacing it with a simplified understanding is the most common market technique. The unsatisfactory state of mass consumer culture, the aloofness of the controlling state structures, their lack of initiative, and in some cases a direct interest in maintaining the current disorder,

make it possible to manipulate public consciousness and control the actions of buyers.

The occupation of the Russian market is, of course, a temporary phenomenon, due to economic stagnation, limited solvent demand of the bulk of the population, and the lack of an effective and consistent policy in the development of national production. However, the apparent conditionality of the situation is not particularly comforting. In Russia they like to joke: there is nothing more permanent than something temporary. In order for a temporary phenomenon not to "stagnate", it is necessary to change the conditions that gave rise to it. There are opportunities. First of all, it is necessary to understand the theory that guides practical actions.

The quality of shoes is determined by a combination of consumer characteristics. It does not matter, in principle, from what material the shoes are sewn. The main thing is that the properties of this material ensure the functional demand for footwear by the consumer.

The buyer is indifferent (with a price balance) of natural or artificial material shoes are made. It is important for him that his requirements for her be guaranteed.

The domestic practice of assessing the quality of shoes (and not only shoes) turns the theory inside out, trying to focus on natural characteristics. What will Russian ideologists of quality do when animal rights activists take them seriously, as happened in Western Europe, in particular in the UK.

The most tragicomic thing is precisely that the nature of raw materials is, indeed, not such a fundamental issue if we improve the technology of processing raw materials. Analogues of natural raw materials are the realities of today's production, and far from being a fantasy. But the misfortunes of quality are by no means limited to the problem of raw materials. No less relevant are other aspects of production: taking into account national, age, natural and climatic features in determining the quality and conditions for the admission of products to the market.

Unfortunately, today the domestic contribution to the development of a policy aimed at improving the quality of footwear, and, in fact, at ensuring the rights of the consumer, is extremely incomprehensible. One gets the impression of a complete detachment of the aspirations of producers from the interests of the country that gave them citizenship.

What are the conclusions:

Firstly, the industry still relies on an outdated position - the simplest and only necessary: do not harm the health of the consumer. Shoe manufacturers and their controllers learned the first commandment of Hippocrates firmly, but did not advance further. In this situation, the siege of competitors is unlikely to be held back for a long time;

secondly, basic properties should not be identified with qualities. Properties can only be qualities in the production cycle due to its differentiation into technological operations. But in this case, it is advisable to take the quality in quotation marks, emphasizing the conditional use of the term. Otherwise, we will begin to operate with philosophical and scientific concepts, which will necessarily lead to a distortion of practical characteristics. Quality is an association of certain properties, therefore it is impossible to pull out the properties that form the association as production needs and pass them off as quality;

thirdly, it is high time to determine the basic properties conventionally, not limited to the proposals of sanitary hygienists and epidemiologists. A lot of value can be gleaned from the research of gerontologists, geriatricians, regional specialists, valologists, pediatricians;

fourthly, until what time will aesthetic properties be practically absent in the basic characteristics, even if in a conspiratorial form.

Satisfaction with the actual replacement of the State is not entirely clear. standards to national standards. The fact that in this component of the ideology of quality we have adopted international terminology is of little use. Now, if our production and ideological positions were equal to European ones, then we could rejoice. And that only adds to the chaos.

In the absence of a corporate culture, traditions, released firms will engage in arbitrariness. State structures have signed their own impotence to manage the development of the market in a civilized manner and remembered the American fairy tale that the market itself will arrange everything and put it in order.

The inefficiency of the state quality control system is not in its status, but in its functioning. Uncleanliness, lack of professionalism of officials do not allow state structures to act fully. According to the official data of the Federal Agency for Technical Regulation and Metrology, on average, there are 2% of certification refusals per year. While more than 30% of products are rejected directly in trade.

In the European Union, mandatory certification is subject to = 4% of the product range, not because European officials are liberals. The reason is hidden in the orders and traditions of production itself, civilized relations in the market, the age of which exceeds the total time of the Romanov dynasty and Soviet power. Haste inevitably entails costs. To move along with all the general formation, it is not enough to get dressed, put on shoes, like everyone else, and stand in formation.

As long as the authorities and manufacturers will portray market relations, the mass consumer will have to pay, as the costs will fall on his shoulders. Exclusive buyers are protected from the vicissitudes of the Russian market by a truly free choice. They purchase goods directly from reputable manufacturers. Officials are ready to do anything to be among the exclusive buyers. Firms are likely of the same opinion and are willing to pay officials for the

freedom of their own actions. The situation cannot be called otherwise than creeping state anarchism. Something early state began to degenerate.

According to Russian official regulations, until recently, 70-80% of the product range requires state quality certification.

Critics reject this practice and suggest borrowing Western European experience.

They are not embarrassed that the share of illegal and semi-legal business in Russia is estimated at 40-60%, i.e. even now, if necessary, to centrally check the quality of 70-80% of the range of goods, the market already has less than 40% of certified goods. It is not clear which manufacturers are protected by the critics? And who will stand up for the protection of consumer rights? Officials or maybe judges, independent only by definition. Only human rights non-government organizations remain, which exist today, and tomorrow they will have a “hedgehog in the fog”.

Franchising is an opportunity today to meet the demand for children's shoes.

Returning to the problem of meeting the demand for children's shoes, I would like to note that even today the volume of its production in Russia remains at such a low level that it is a utopia to expect the market to quickly fill the market with the necessary children's shoes in terms of quantity and assortment. The hope for imports also did not justify itself, since in most cases these are shoes accidentally bought by "shuttle traders" without taking into account the characteristics of the Russian consumer and, as a rule, without observing elementary requirements to ensure the necessary comfort and convenience.

This state of affairs is also explained by the fact that at the federal level, the programs “Family”, “Child”, “Large Families”, etc., well written on paper, but not provided with targeted assistance to this particular group of the population, remain unrealized. What makes the situation with providing children with all the necessary assortment of goods critical is the disunity of the organizations participating in the implementation of these programs, the lack of funds and targeted assistance. Even the payments of child allowances in many regions of the country cause an ironic grin from those to whom they are addressed, because of their size and significant delays in time with their payment.

The situation is further aggravated by the fact that shoe companies that today operate and manufacture children's shoes are geographically located in such a way that they cannot meet the demand for them geographically. And the volumes that they can handle today do not satisfy the consumer either in terms of assortment or quality. Practically they do not make shoes with thread fastening methods, gender and age groups are not provided, which has already been discussed a lot on the pages of the magazine. It is not necessary to expect the resumption of work of the former shoe enterprises, therefore, in order to increase the volume of retail sales, it is proposed to use franchising. The structural diagram of cooperation between large shoe enterprises - franchisors with franchisee-small enterprises, or with individual entrepreneurs to meet the demand for children's shoes is shown in Figure 1.

If the role of the franchisor, most often, is a shoe company, then the role of the franchisee is ambiguous. It is profitable for a large enterprise to either sell a franchise to two or three local individual entrepreneurs - in this case, the enterprise has favorable conditions for studying the local market and doing business; or sell a franchise to one franchisee for the development of the entire system for deploying the sale of shoes on the territory of the municipal, regional level, as well as on the territory of the entire Federal District.

In this case, the franchisee becomes the owner of the master license. The franchisee himself becomes a franchisor selling franchises in these territories. This method is justified for our case, when there is such an acute shortage of children's shoes in the country and when there will always be an obvious demand for a franchise. Such cooperation today provides for three possible areas for the franchising system:

in the field of production of children's shoes - a shoe company-franchisor - is the owner of packages or technologies, it provides the right to use and sell them in a certain territory - to the franchisee; in the field of commodity circulation - a shoe company supplies a partner, for example, an individual entrepreneur, with shoes for sale in a certain territory. This area of franchising, in addition to individual entrepreneurs, can be engaged in small businesses, commercial structures seeking to expand sales markets.

A prerequisite is the implementation of commercial activities on behalf of the franchisor; in the service sector, the mechanism is similar to that used in the sphere of commodity circulation, i.e. when selling children's shoes. Only the objects of cooperation differ. Any business can develop here according to the franchising system. Promising areas include "branded" stores.

Such areas of cooperation within the framework of franchising allow operating shoe enterprises to expand their production volumes, taking into account the requirements of municipal or regional levels, as well as the Federal Districts, and the territories to alleviate the acute shortage of children's shoes.

When concluding a franchise agreement, the franchisee must pay special attention to the issues of relationships, to provide for all the nuances of cooperation. This is the need to conduct marketing research, the state of the sales market, the forecast for the demand for children's shoes, the strengths and weaknesses of competitors and how they can be countered, is it possible to make purchases of children's shoes from other enterprises, is there a minimum or maximum size of wholesale purchases, or these volumes are adjusted based on the results of

marketing research, whether supply disruptions are possible and who will compensate for the losses in this case. And, most importantly, does the franchisor guarantee the stability of selling prices for footwear in order to ensure its competitiveness in the sales market. And the franchisee must know exactly the needs for such an assortment of children's shoes, which will be in demand by the market, taking into account these very features of its market. Only in such a relationship is a stable profitable business possible. Such a result will be possible only if the maximum possible hit in the "bull's eye" in the manufacture and offer to the buyer of such an assortment, which will take into account the interests of all segments of buyers - from rich to poor, is ensured.

Of course, not everything is so simple and unambiguous, but the accumulated experience in the Ekonika Shoe franchising system is encouraging. The development of franchising in our country may turn out to be one of the most effective forms of support for small and medium-sized businesses, since for them it is a stable profitable business. According to statistics, during the first three to five years, 90% of open small businesses die, and only 10% of franchised ones. This result is ensured by the interest of the parties involved in the effectiveness of their cooperation - the leading shoe companies are expanding and strengthening their positions in the sales market in these regions, and the franchisees are providing themselves with a stable profitable business, removing the shortage of such demanded products as children's shoes and creating new workers. Places.

On fig. 1 shows the range of children's shoes that would be in demand in the Southern and North Caucasian federal districts, taking into account climatic features and purchasing opportunities of the population.

Fig. 1. Assortment of children's shoes

At the same time, the trends in the use of molded parts for the bottom of shoes are taken into account, although the possibility of implementing thread fastening methods for children's shoes is not excluded. In general, action is needed and the result will not keep you waiting.

Features of quality management for the production of competitive and popular leather goods using nanotechnologies.

Conclusion

Identification expertise associated with the establishment of physical and chemical properties, quantitative and qualitative composition of the goods, allowing unambiguous identification of the goods in accordance with the TN VED of Russia. In accordance with the Federal Law of December 27, 2002 No. 184-FZ "On Technical Regulation", "product identification is the establishment of the identity of product characteristics to its essential features." In other words, product identification is the establishment of conformity of a specific product with a sample and (or) its description. A description is understood as a set of features, parameters, indicators and requirements that characterize products, established in the relevant regulatory documents. For example, product descriptions can be standards, specifications, labels, labels, shipping documentation, design and operational documentation.

Identification is carried out in order to protect the consumer from an unscrupulous manufacturer (supplier, seller), to ensure the safety of products for the life, health of the consumer and the environment, as well as to confirm the compliance of products with the requirements for it.

Identification as a procedure can be carried out in cases specified by law or on an initiative basis. In the customs business, the need for identification may arise in connection with the false declaration of goods, the code according to the TN VED, the provision of invalid documents, the destruction, damage, removal, change or replacement of means of identification, etc.

Identification examination allows you to identify counterfeit goods.

falsification(from lat. Falsificare - to forge) - this is a fake of objects, performed for selfish purposes during the process of exchange, sale, etc. As a rule, falsification is aimed at deteriorating the properties of the object of sale while maintaining the appearance of the product in order to deceive and obtain illegal profits. In customs, on the contrary, in order to reduce the payment of customs duties, unscrupulous participants in foreign economic activity can declare a more expensive and high-quality product as less quality, or they can declare finished products as raw materials or semi-finished products.

There are main types of falsification: assortment, qualitative, quantitative, informational, cost and complex. Assortment falsification is due to the replacement of one object with another, less valuable one.

Qualitative falsification -this is a fake of an object of the same type, but with a lower degree of quality (regrading), i.e. replacement of goods of the highest grade, class, category, etc. lower. Quantitative falsification is due to underinvestment, underweight, underfilling, shortage in the number of units on the fact and in shipping documents.

Information falsification includes falsification of labeling, for example, non-compliance with consumer information requirements, falsification of documents.

*Cost falsification*is the sale of low quality goods at prices of higher quality goods.

Complex falsification includes all or several of the above types of fraud at the same time.

Material science expertise associated with the establishment of physical and chemical properties, structure and material of goods, chemical compounds, substances.

Commodity expertise is aimed at determining the commodity characteristics of goods and their free (market) value (price).

Technological expertise- this is an examination of the harmonization of the norms for the output of products of processing of goods, taking into account a specific technological process when applying customs regimes for processing on and outside the customs territory of the Russian Federation. Technological expertise is carried out mainly in relation to the following goods: oil and oil products; goods of chemical and related industries; metal ores, scrap metal, metals and alloys; paper, wood and products from it; leather and textiles.

*Artistic expertise*is carried out in order to establish the historical, artistic, cultural, scientific significance of works of art and antiques. Features of the customs examination of goods on the basis of legal norms in the system of customs clearance and control are considered in detail.

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 29.03.2023 **http://T-Science.org**

Issue Article

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ON THE IMPORTANCE OF THE PHILOSOPHICAL COMPONENT FOR A SUCCESSFUL STRATEGY FOR MANAGING THE QUALITY OF MANUFACTURING PRIORITY PRODUCTS

Abstract: *In the article, the authors analyzed the state of the market in the regions of the Southern Federal District and the North Caucasus Federal District, confirmed the presence of a significant shortage of shoes, which justifies the expediency of forming enterprises and consumers in these regions. At the same time, we were able to form the entire product range that would satisfy the needs of consumers in these regions, with the rationale that it will be in demand and competitive through the formation of innovative technological processes using a quality management system to ensure quality management, forming its advantages over other manufacturers and ensuring the realization of consumer preferences. In addition, by forming preferences among consumers in these regions, business leaders significantly improve the socio-economic situation in these regions.*

Key words: *enterprises, consumers, regions, assortment, assortment policy, competence, preference, production management, product quality, demand, competitiveness, stable financial position, stable TEP, demand, profit, innovation, quality, means, person, social factor, reasonableness, prudence , evolution, education, reality, actuality, criterion of reasonableness, criterion of reasonableness.*

Language: *English*

Citation: Blagorodov, A. A., Vilisova, M. L., Okhrimenko, O. I., Prokhorov, V. T., & Volkova, G. Yu. (2023). On the importance of the philosophical component for a successful strategy for managing the quality of manufacturing priority products. *ISJ Theoretical & Applied Science, 03 (119)*, 227-244.

Soi: http://s-o-i.org/1.1/TAS-03-119-31 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.31

Scopus ASCC: *2000.*

Introduction

UDC 685.17:519.47

It is not God who lays down historical routes, they are not developed a priori, they have to be laid, mastering a new historical space. The professional traveler does not hide behind the laws of nature, exploring the unknown. And politicians should show an innovative approach, improve the legal order of things. Laws are not absolute, they reflect reality generalized in legal terms. Politics, on the other hand, is the art of managing a historically specific, time-changing reality. Situational thinking is important here. Realizing that it is impossible to build a new industry, to activate agricultural production without free access to maritime transport, the first Russian emperor resorted to extreme measures. In our time, there is no such need - thanks to Peter I - which makes the fate of politicians easier,

Russian laws regulate the market space. The market space is a legally formalized reality, built conditionally according to the formula “this is how it should be”, and this does not mean at all that it is and will be so.

Main part

The actual market reality is built as an environment of interdependent coexistence of the manufacturer, the seller (if the manufacturer does not act as such) and the buyer-consumer (the inclusion of a reseller is highly undesirable). The market liberals led by Y. Gaidar created an imaginary market, an ideal object outside the historical context, and therefore did not reform, but destroyed the country's economy. Yeltsin and the company legalized looting. The economy that did not fall victim to the shock was thrown like a bone from the master's table to ordinary bandits, thieves and swindlers. From the economic hell of the 1990s, only those who least of all considered the law and conscience emerged alive, strong and rich. That is why the economic collapse was followed by a spiritual crisis that continues to this day.

Quality, properties, measure, before the appearance of human interest in them, were just objective natural characteristics of things, the processes of their formation and transformation. The accumulation or reduction of quantity led to a critical mass - the border of "qualitative quantity". The measure that characterizes the quantitative interval - the limits of the development of quality, warned that further change is advisable only in a different qualitative expression. Of course, quantity in itself is not capable of turning into quality. The new quality emerges from the old quality. And the way to change quality is different from the way to change quantity. Quantitative changes are continuous, qualitative ones, by definition, are discrete.

The emergence of human activity has significantly changed the understanding of the quality and associated characteristics of being. Social-historical processes were added to the natural historical processes of the development of nature. Man actively began to restructure the natural prerequisites of his being, considering them as a raw material base for the struggle for his own existence. It should never be forgotten that the essence of man is practical. F. Engels was absolutely right when he asserted: man, of course, is a creative being, but before creating and surprising, he must eat, drink, dress, put on shoes and have a reliable roof over his creative head. He does not find what is necessary in ready-made form in nature, therefore the foundation of human existence and his progress will always be practical activity, material production in all its diversity of directions.

To two objective, natural dimensions of quality - natural properties and dimension, a third is added - an assessment of quality in the projection of the needs of human existence, combining objective and subjective principles. Historically, the range of quality media has changed. Today, it includes, along with the quality of objects of the material world, the quality of raw materials, semi-finished products, final forms of commercial products, software products, phenomena of spiritual culture, the most creative activity of people and ways of preparing for it - the quality of vocational education.

On the way of our knowledge, the contradictions of the world have set many traps. They are calculated both on the weaknesses of our psyche and on the “inclinations” of the intellect. In an effort to understand quality, one-sidedness and inconsistency are especially dangerous.

Figure 1. Assortment of women's shoes (models 1 - 3)

Figure 2. Assortment of women's boots

Table 1. The cost of organizing an advertising company

Name of service	Service cost
TV advertising: - video - ticker	 1500 rub/week 10 r/word (week)
Flyers	10 r/sheet
Shop sign	25000 r
Press advertising	70 rub/week

For example, let's calculate the cost of an advertising campaign and the creation of an Internet site for enterprises in the city of Shakhty (table 3).

In general, advertising costs for businesses amount to 2% of the production cost and are included in the costing item "Sales expenses". At the same time, advertising costs will pay off, because. the volume of sales of the company's products will increase by an average of 3%.

One of the effective types of advertising is outdoor advertising, which means include:

- poster advertising;
- liquid crystal screens;
- transport advertising.

The best options for outdoor advertising are a simple drawing, the use of contrasting colors and the use of sans-serif fonts.

The advantages of outdoor advertising include flexibility, a high rate of repeat contacts, low price, lack of competition.

In this regard, I would like to note an interesting fact - men always pay attention to the purple color, because they associate it with the color of war, and women to yellow - for them it is the color of the sun.

Table 3. Calculation of advertising campaign costs

Name of indicator	Amount, thousand rubles
Advertising companyfilming a video ticker printing leaflets payment for the services of leaflet distributors (5 people)	 58.8 (for 1 year) 120.0 (for 1 year) 75.0 50.0
Website creationpayment for web-designer services payment for Internet provider services monthly hosting	 8.0 10.0 6.0 (for 1 year)
TOTAL	329.14

An analysis of literary sources showed that in Russia the share of TV advertising in recent years has been about 30-40% (for comparison, TV advertising in Norway is only 1.5%). There is an assumption that it will significantly decrease due to the new Federal Law "On Advertising". In the new law, in comparison with the previous law of July 18, 1995, the concepts of unfair and false advertising are more clearly defined (both are not allowed).

An advertisement that contains information that does not correspond to reality is recognized as unreliable, for example:

- about the advantages of the advertised product over the goods in circulation, which are produced by other manufacturers or sold by other sellers;
- about any characteristics of the product, including its nature, composition, method and date of manufacture, purpose, consumer properties, conditions for the use of the product, its place of origin, the presence of a certificate of conformity or a declaration of conformity, marks of conformity and marks of circulation on the market, service life, shelf life of the goods;
- about the cost or price of the goods, the procedure for its payment, the amount of discounts, tariffs and other conditions for the acquisition of goods;
- on the results of research and testing;
- about the actual amount of demand for the advertised or other product;
- about the rules and terms of holding a stimulating lottery, contest, game or other similar event;
- about the manufacturer or seller of the advertised product, etc.

In the light of the events of recent years, it should be noted that the new law does not allow the use of

swear words, obscene and offensive images, comparisons and expressions in advertising, including in relation to gender, race, nationality, profession, social category, age, language person and citizen, official state symbols (flags, hymns, coats of arms), religious symbols, cultural heritage sites (monuments of history and culture) of the peoples of Russia, as well as cultural heritage sites included in the World Heritage List.

The new law "On Advertising" noticeably reduces the maximum daily amount of television air time devoted to advertising. Significantly increased administrative fines for violation of advertising legislation.

To increase the competitiveness of light industry goods, enterprises that produce it should not be afraid to use such a powerful weapon in the business world - advertising.

Leather craft is one of the oldest in Russia and in the world, but at the same time, it attracted the attention of ethnographers and archaeologists less than other ancient industries. The inhabitants of the warm regions of Africa (Akka and Bushmen) have been making furs since ancient times, and the Indians made them for 3 thousand liters. BC (used as a cover - protection from the cold). Geographically, it is almost impossible to determine the place of origin of human use of fur and leather. It is known that the descendants of the Paleolithic man, the Fuegians and Patagonians, wore undressed furs, and sewed them together with belts. Some Hyperboreans of Asia, Europe and America did the same. The Yakuts cut off the leg parts of the animal skin and, without dressing, wore it as shoes. Herodotus (V century BC) indicates that the Scythians wore furs, and Tacitus (I century AD) writes that the Germans dressed in the same way, Finns and Northern Slavs…. The 16th century was not easy for the Russian state. Serfdom, which hindered the development of productive forces in the rural peasant economy, and the growth of feudal oppression led to the beginning of the development of handicrafts, commodity production and trade. In settlements located on important trade routes for the Russian state, handicrafts and handicraft industries began to actively develop. One such example is the village of Kimry, located at the confluence of the Volga and Kimrka rivers. The first mention of it refers to 1546 (letter of John the Terrible). Being on a busy waterway, connecting it with almost any corner of the country, gave the local residents involved in shoemaking the opportunity to market their products and contributed to the development of the craft itself. The origin of the shoe industry in those parts is due to the abundance of sources of raw materials: the locals were engaged in fishing, hauling and pilotage, and such cities of the upper Volga basin as Yaroslavl, Uglich, Torzhok have been famous for centuries for the production of leather. Already in 1635, there were 6 shoemakers' yards in Kimry. An interesting fact is that in the early 16th century, when the ancient field tax was replaced by a poll tax, the payment of the poll tax for the Kimryaks was transferred either to money or to boots.

All this led to the fact that by the middle of the XVII century. more than half of the peasant families in Kimry were engaged in shoemaking. Since that time, shoemaking began to cover entire volosts of the neighboring counties surrounding Kimry, thus, a “shoe kingdom” arose, the capital of which was the village of Kimry.

By the middle of the XVIII century. handicraft production gradually develops into manufactories, and Kimry becomes a kind of center for the shoe industry of a rather vast territory. I would like to note that, unlike the typical capitalist manufactory, based on the unification of the labor of workers, the dominance of manual labor and its division within the workshop, the peasant manufactory of that time had distinctive features. Here, as it were, the features of serfdom and the emerging capitalist relations were intertwined. The workers of the manufactory were at the same time serfs. The owner himself was also a serf. The landowner, the owner of the patrimony, was considered the legal owner. Therefore, all transactions at the enterprise were concluded on behalf of the landowner. But, despite this, in the hands of those who were engaged in practical guidance. Considerable capital was accumulating.

In the 17th century in Rus', mainly shoes were made from yuft. It was applied in one piece, hood. In order for the shoes to last longer, leather soles were made of two or three layers and were lined with iron horseshoes. Similar boots were widespread in the XVIII century. Under Peter I, with the creation of a regular army, its equipment required special quality shoes. The Kimry shoemakers had to fulfill military orders. To do this, they needed to master a previously unknown technology and, in addition, learn how to sew shoes according to the samples sent. Military boots and boots were made on a hard sole with a hard back (to protect against deformation and rapid wear of the upper material) and a hard toe cap (to maintain the shape of the shoe and protect the toe). The heel appeared why the sole in the shank part was reinforced by a special part - the shank. Over time, the skill of the Kimry craftsmen improves. This was largely facilitated by otkhodnichestvo, when many shoemakers went to Moscow, St. Petersburg in search of work. The capital's craftsmen owned higher technology, fulfilling the exacting orders of clients of the wealthy classes. For centuries, the skills of skilled shoemakers have been developed.

An interesting case is described by V. Gilyarovsky in the work “Moscow and Muscovites”: “There was a police chief Luzhin in Moscow in the sixties, a passionate hunter who kept his kennel near Moscow. Boots with paper soles were handed to him on the Old Square, and he complained about this to his master .... Luzhin sent him to find out the details of this trade. Soon the hunter came and reported that

today early on the Old Square ... they brought several cartloads of shoes from Kimry.

Luzhin, taking a squad of police with him, rushed to Old Square and unexpectedly surrounded the warehouses of shoes indicated to him ... Luzhin ripened at the very time when shoes were dumped from the wagons into warehouses. Everyone was arrested: both the owners of the warehouses, and their trustees, and the buyers and sellers of shoes who arrived from Kimry with carts. Having sealed the goods and warehouses, Luzhin sent the arrested to the city police station, where the musketeers flogged both the owners of the warehouse and the Cymrian merchants who brought the goods.

The merchants swore under the rods that they would never trade such goods, and the Kimryans, after a severe flogging, vowed that not only they themselves, but their children, grandchildren and great-grandchildren, would order, under pain of a father's curse, to put paper soles.

And, indeed, the Kimryaks began to work honorably, on paper soles, until the Turkish war of 1877-1878. was not heard. But during the Turkish war, the children and grandchildren of the Kimryaks were “engaged in a bad deal,” as they explained in court, by army suppliers who gave huge orders for the manufacture of boots with paper soles. And soldiers in torn boots climbed the snows of the Balkan and Caucasian and died from a cold ... And again, since then, paper soles have gone.

By the end of the XIX century. Shoe production in Kimry reached its highest dawn. By this time, it covered 35 volosts of Kimrsky, Kashinsky and Kalyazinsky districts of the Tver province. This shoe region was called the "kingdom of shoes."

A great influence on the further development of the Kimry shoe production was made by the open at the beginning of the 20th century. Sverdlovsk railway, connecting Kimry with Moscow. In this regard, the turnover of local trade almost doubled. Gradually, capitalist manufacture began to outlive itself. The factory form of production was born.

In 1903-1906. merchant A.N. Stolyarov is building a brick factory building. The factory, called "Anchor", in March 1907 produces its first products. In the same 1907, the factory produced 20 thousand pairs of shoes, the number of workers was 64 people. Constantly expanding, by 1913 the output was already 121.2 thousand pairs with 286 workers.

During the First World War, orders for military footwear increased sharply. Factory "Anchor" entered into millions of contracts for the tailoring of boots and shoes. However, the war undermined the Russian economy: at the end of 1916, the country was going through an acute crisis. When news of the revolution in St. Petersburg reached Kimr in February 1917, dual power arose in the village. At the beginning of April, a branch of the trade union of tanners was organized at the Yakor factory.

Shortly after the October Revolution, on November 14, 1917, the government issues the "Regulations on Workers' Control", which must be carried out by factory committees. And in the summer of 1918, first large, then medium-sized industry of the country was nationalized. Despite the lack of raw materials, fuel, food, the enterprise continued to work even in the conditions of the civil war. In the same year, 1918, the Kimrsky Museum of Local Lore was founded - a branch of the Tver State United Museum.

In 1920, the factory received an urgent and secret order for the production of boots of a special special cut for the front. In 1923, the factory was renamed "Red Star", this name has been preserved to this day. According to the census of the small handicraft industry of 1925, the share of shoe and shoe production in terms of the number of trade farms was:

RSFSR 4.88%,

Central industrial region 16.13%,

Tver province 72.63%,

Total in the USSR 3.18%

During the Great Patriotic War, the factory supplied the Soviet Army with footwear, and in the post-war years it switched to civilian production. Gradually, the factory expanded, new production buildings were built and launched, new equipment was introduced, technology was improved .... Having survived the years of wars and perestroika, the factory continues to function at the present time.

The permanent exposition of the Kimrsky Museum of Local Lore, the area of which is 752 sq. m, introduces visitors to the history of the region from ancient times to the present day. The richest collection of Kimry shoes of the 16th-20th centuries, photographs, documents and unique wooden sculptures by I.M. Abalyaev, depicting scenes from the life of handicraftsmen-shoemakers.

The condition for the consumer to choose a product in a large assortment offered on the market is the coincidence of its technical parameters with the conditional characteristics of the forecasted demand. From this point of view, the enterprise management strategy should be built on the principle of a "tracking system" with feedback, i.e. it must provide consumers with products that meet their specific requirements for quality and related service when it is sold, while constantly monitoring the degree of such satisfaction (see figure 6).

Tracking the quality of goods and related services consists of two stages. At the first stage, the manufacturer, through marketing, studies consumer expectations in terms of the quality of products and services for its promotion. Based on this information, functional specifications for new products and service quality are determined, which will depend on the ability to determine customer expectations and the ability to adapt production technologies to changing customer expectations.

The second stage consists in the periodic "measurement" of the mismatch between the actual

and expected level of product quality and related services. In accordance with the magnitude of the mismatch, the activity of the enterprise should be aimed at developing control actions on organizational and technological units in order to reduce the discrepancy and introduce new methods for assessing quality parameters.

$$W = \langle X, P, A \rangle \quad (1)$$

where X is the set of possible solutions (objects) such that x∈*X*- an element of this set, given on X by means of some rules for the technology of manufacturing and distributing goods; P is a countable set of quality indicators and their corresponding measurement scales; A is an evaluation algorithm that implements the logic of comparative evaluation of alternatives in the form of "better-worse".

Any solution x∈X is represented by the vector P(x)(P1(x),..., Pm(x)) in the m-dimensional space of quality indicators defined as the Cartesian product P P1 ... Pm Rm, where Pj, (j=1, m) is the set of admissible values of the j-th indicator, which is a subset of the set of real numbers R.

Evaluation of product quality consists in determining the degree of compliance of the evaluated object with the purpose of its functioning. The goal can be set indirectly - with the help of a "standard" of quality. The standard of quality is the set {Pjd} of the basic values of the indicators of the quality of production and marketing of products, which to the greatest extent satisfy the expectations of consumers.

The numerical representation of the quality level can be represented by a tuple (2):

$$R = \langle \varphi\ A, P, P_{\delta} \rangle \quad (2)$$

where R is a mapping of the set PP Rm onto the set of real numbers R, i.e. A is a multidimensional scale for assessing the level of quality. Whence it follows that WX,P,P , , for any x∈X sets a number depending on the position of the point (vector) P(x) (P1(x),..., Pm (x)) in the space of quality indicators. When assessing the quality level, several types of scaling are used.

1. Relationship scaling. It consists in determining the relative quality indicators j Pj /Pj , which determine how many times the evaluated object is better or worse than the base one in terms of the j-th quality indicator (j=1,m). The scaling operation is also a normalization operation.
2. Difference scaling with normalization. It consists in presenting the assessment of the quality level according to the j-th quality indicator in the form (P Pj)/Pjδ, where the coefficient expressed as a percentage ω shows how the estimated object is better or worse than the base one.
3. Multidimensional scaling. Based on the definition of the generalized indicator W, where $\omega = (\omega_0, \dots, \omega_m)$ is a vector of relative quality indicators.

The generalized indicator characterizes the degree of compliance of the object with its purpose. Thus, we arrive at an algorithm for assessing the level of product and service quality in each specific case. The algorithm for a comprehensive assessment of the quality level is shown in Figure 7.

At the final stage when making a decision, firstly, it is necessary to decide how acceptable the result is (whether the accuracy and reliability of the assessment is acceptable). If it does not meet the requirements, a decision may be made to conduct a re-evaluation, additional studies to obtain new information, etc. If the result is objective enough, appropriate decisions are made depending on the objectives of the assessment. For example, if the goal of evaluating the quality of several possible product options is to select the one that best meets the needs of consumers, then the option that received the highest rating can be accepted for production.

Forecasting quality costs when developing a new range of shoes.

To a large extent, the reason for the non-competitiveness of domestic footwear was the erroneous methodology for measuring and evaluating its quality. The problem lies in a certain discrepancy between the assessment of the quality of footwear designed at the development stage, formed at the production stage and verified during the final control before implementation with the consumer quality assessment. The gap between real quality and consumer requirements has a significant impact on consumer preferences and, consequently, on competitiveness. The smaller this gap, the higher the competitiveness of shoes. The difficulty lies in the fact that when evaluating the quality of shoes, the consumer is guided to a large extent not by quality indicators regulated by regulatory documents, but by his own tastes and ideas about what shoes should be And sometimes the idea of quality among many consumers is superficial, at the level of mainly organoleptic indicators, which do not always fully and objectively characterize shoes.

Very often, the need to assess competitiveness arises even before the appearance of new products, i.e. at the design and development stage. Since the level of costs during the period of consumption and operation by more than 80% depends on the characteristics of footwear laid down at different stages of its development. At the stage of detailed design and development of a prototype, the designer can influence the reduction of no more than 15% of these costs, and when the product is put into production, this indicator can be changed within only 5%.

Therefore, at the pre-project stage of creating new products, a multi-variant forecast should be developed, which is information about the possible technical implementation and the timing of achieving the identified goal.

In this regard, the task of studying the characteristics of consumer demand for footwear is the main one for improving the quality and competitiveness of products. It is necessary to establish by what criteria the buyer evaluates the quality, because he will try to purchase shoes with a combination of properties that he desires.

In order to assess the significance of indicators of consumer quality of footwear at the stages of its design, production and sale, we used an expert method of personal assessments - ranking, which allows us to sufficiently take into account the opinion of both shoe manufacturers and potential consumers.

Experts are invited to rank the totality of factors that determine the consumer quality of footwear. The original ranks are first converted like this:

$$R_j = \sum r_{ij}, \quad (3)$$

where Rj sum of transformed ranks for all experts for factor j; rij the transformed rank assigned by the i-th expert to the j-th factor; m is the number of experts; n is the number of factors. Then the weights of the factors are calculated:

$$R_j = \sum_{i=0}^{m} r_{ij}, \quad (4)$$

$$w_j = \frac{\sum_{i=0}^{m} w_{ij}}{\sum_{i=0}^{m}\sum_{j=0}^{n} w_{ij}}, \quad (5)$$

where W j is the average weight of the j-th factor over all experts.

The group of experts, consisting of 100 people, was divided into two groups during the survey: consumers and manufacturers. A number of requirements were imposed on the candidacy of the survey participant from the group of manufacturers:

-special education;

-position held;

-seniority.

To search for experts, leading specialists from shoe enterprises in the cities of the Southern Federal District were involved: Shakhty, Rostov-on-Don, Krasnodar, Volgograd, etc. To work as experts, teachers of the Department of Technology of Leather Products, Standardization and Certification of the South Russian State University were also involved economy and service.

During the survey, the experts ranked the indicators according to the degree of importance, i.e.

According to the degree of their influence on the quality of shoes. As an object of study, women's shoes were chosen - boots of the autumn-spring assortment.

During the survey, the experts were offered a questionnaire containing factors that affect the quality and competitive advantages of footwear at the stages of design, production and sale (table 4).

Table 4. Questionnaire

Factors	Rank
1	2
Shoe design stage	
X1 - compliance with fashion trends	
X2 - the shape of the toe	
X3 - heel shape	
X4 - heel height	
X5 - sole thickness	
X6 - shoe upper blank design	
X7 - model design	
X8 - color solution	
X9 - shoe flexibility	
Shoe production stage	
X1 - type of top material	
X2 - type of bottom material	
X3 - the quality of the connection of the top parts	
X4 - the quality of the workpiece of the upper shoe	
X5 - stiffness of the toe	
X6 - back stiffness	
X7 - fastening strength of the bottom parts	
X8 - the quality of the bottom finish	

Shoe sales stage	
X1 - attractive appearance	
X2 - product novelty	
X3 - weight of shoes	
X4 - price	
X5 - brand prestige	
X6 - advertising	
X7 - services	
X8 – packaging quality	

The respondents were asked to arrange the factors in descending order of the degree of their influence on the quality and competitiveness of footwear (rank), i.e. the factor that the expert considers the most important gets a higher rank - 1, and the rest - according to the degree of reduction of their influence on the competitive advantages of footwear, those. 2, 3 seats, etc. If the expert could not make a decision on assigning a place to two or more adjacent factors, then he assigned them the same rank.

Processing of the results of the expert survey was carried out on a PC using a special program "RANG". The nature of the distribution of ranking results indicates that the opinions of consumers and manufacturers, acting as experts, agree on many points.

At the design stage, significant quality indicators were established: compliance with fashion trends - X1; toe shape - X2; heel shape - X3; heel height - X4; shoe upper blank design - X6; model design - X7. Less significant: color scheme - X8; shoe flexibility - X9; sole thickness - X5. After statistical processing of the results of the expert survey, it turned out that all of the above factors remained significant.

At the production stage for manufacturers and consumers, significant factors are: type of top material - X1; type of bottom material - X2; the quality of the connection of the top parts - X3; the quality of workmanship of the workpiece of the top of the shoe - X4; fastening strength of bottom parts - X7; back stiffness – X6; the quality of the bottom finish is X8.

At the implementation stage, significant indicators of footwear quality for all experts are: attractiveness of appearance - X1; product novelty - X2; price - X4; weight of shoes - X3; brand prestige - X5. Less significant - advertising - X6; services - X7; packaging quality - X8.

To predict the cost of quality, taking into account the requirements of consumers when developing a new range of footwear, based on the results of an expert survey at the design stage, it is necessary to determine the weights of all significant factors using formula (4).

Let us assume that the costs of improving the quality of one unit of production for each factor are known, which are determined by the vector:

$$p(p1, p2,..., pn). \quad (4)$$

Then it is possible to determine the expected costs of changing the quality of the designed product:

$$M(X)p1w1\ p2w2\ ...pnwn. \quad (5)$$

This method of estimating expected costs can also be used at the stages of production and sales of products.

The conducted studies cover the entire range of consumer and production requirements for footwear that affect its competitiveness, and also allow predicting the costs of improving quality at all stages of the product life cycle and should be taken into account by manufacturers when forming a range of footwear.

In many industries, when preparing the mass production of new samples, it becomes necessary to compare them in order to decide on the sequence of manufacture or select one from a number of designed ones, as well as for very effective advertising, presenting the technical advantages of the product to the buyer. In common practice, this problem is solved by an expert evaluation of the product by specialists using difficult-to-compare technical and economic indicators that have different levels of significance and measurement dimensions, for example, products have different weight in kilograms, cost in grams, air permeability dm3/m2s. Finding the characteristics of product evaluation is achieved through a complex compromise due to the loss of the specifics of each indicator, the introduction of criticized subjective coefficients of “importance”, etc., which is difficult to justify and prove. This part of the intellectual problem can be more convincingly solved in a human-machine system with a network architecture for product evaluation. For example, such an assessment can be obtained in the design training management system for light, food and other industries, by visualizing the total assessment of products. Then the provision of control is reduced to choosing such a trajectory in the multidimensional phase space of product properties that best satisfies the criteria of the main function of a complex system (for example, conquering the product market, manufacturing and selling all products within the specified time frame). In traditional system analysis, in such problems, a complex system is formalized by decomposing it into a selected number of subsystems. However, in this case, connections - relations between subsystems do not have a topology,

they are formally separated. This can be compensated for by such a formalization method, in which connections - relationships will be revealed using the mathematical apparatus of set theories and general topology, and in particular the model of a fluctuation capsule of parameters. The implementation of such a comparative analysis of a number of products among themselves and the identification of priority is relatively simple (Figure 5).

The entire information field is divided into planes by four lines, forming 8 vectors and 8 zones (there may be another number). Information about each of the eight properties selected in our example is applied to the line. In this case, to characterize shoes, demand is the cost price, weight and flexibility, vapor permeability and moisture capacity, aesthetic properties (points) - environmental (sanitary) pollution by non-natural materials. The obtained experimental numerical data are plotted on the rays of the graph, if available in natural units of measurement, for example, the cost in hryvnia, weight in grams, and the demand and aesthetic properties in points assigned to them by specialists. Obtained in the form of a polygon, a visual visualization of a complex system allows the designer or the buyer to make the right decision on the comparative evaluation of different models of products.

In addition to visual information, this figure contains a number of other information. For example, the values of the areas of the figures enclosed between the beams, their sums reveal the advantage of the areas of "positive" indicators of high aesthetic properties and demand for flexible shoes over a product with a large weight, cost, and less environmentally friendly artificial parts. So, in the example shown in Figure 4, N1 has an advantage in terms of the combination of indicators of two samples, which has a large total area in the “positive” sectors of properties. This is an effective method of visual advertising, helping to choose a sample with higher "total" properties that are difficult to compare with each other.

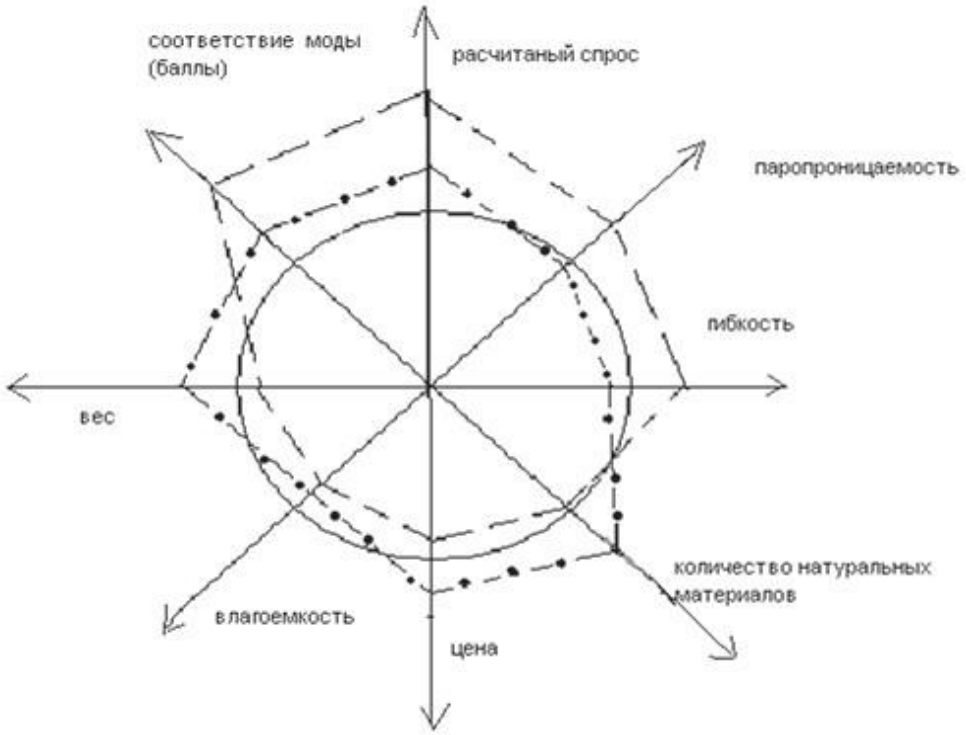

Figure 5. Total properties for a combination of indicators of shoe samples

This method of choosing the “best” product is relatively simple and clear, which allows you to make the right decision. This method can be used for technical and business evaluation of various products of industries - light, food, electronics (for example, INFINITE, shown at the CEBIT - 2006 exhibition), etc.

At the level of intersection of the circle and the axes, the values of eight indicators are normalized (if any) or average for the assortment in their units, the data of each sample N1 ..., N2 ..., etc. are connected by straight lines. applied to the axles.

Improving the quality and competitiveness of domestic special. Shoes.

The development of scientific and technological progress in the production of special. footwear is connected not only with the improvement of technology, the creation of promising materials and automated equipment, but also with the giving of new useful properties to it, as well as with the development

of modern methods for assessing the quality of footwear and testing equipment.

The creation of products with a higher level of quality, approaching and even surpassing the Western one, should be considered as the main direction in the development of domestic shoe production. It is necessary to develop safety footwear designs with an extended set of properties and characteristics, which must be strictly marked and metro logically controlled.

To improve the efficiency of metrological quality assurance of safety footwear in the near future, it is necessary to combine with international standards (ISO) in force in the EU (European Union):

nomenclature of measuring instruments and measurement accuracy standards; methods for performing measurements, tests and control;

metrological certification and calibration of instrumentation and testing equipment.

In recent years, many domestic industry standards have ceased to meet modern requirements and need to be radically revised so that the normalized and regulated characteristics of footwear correspond to the achieved world level of science and technology and take into account the development trend of standardized objects.

The globalization of the world economy makes it necessary to bring domestic standards, in particular for safety shoes, to international standards (ISO), the indicators of which are more stringent and expanded in terms of nomenclature. This is necessary for enterprises interested in foreign investment, seeking to attract foreign customers and, thus, enter the Western market and adequately resist South Asian competitors.

For the successful implementation of domestic regulatory and technical documentation for special. shoes that reflect generalized data on the quality of shoes, providing comprehensive evaluation methods that guarantee a high level of product. First of all, it is necessary to change the mentality of the customer and bring it closer to the Western one.

Philosophy of the western customer spec. shoes for employees of their company is as follows. If an employee of the company feels comfortable when wearing shoes, does not have unpleasant and irritating effects when the foot contacts the shoes, he is not distracted by these factors, respectively, his attention is not scattered, he makes fewer mistakes in his work, gets less tired, his productivity and quality work is on the rise. Unfortunately, the view of our entrepreneurs on spec. footwear for employees is radically different. They prefer to minimize this item of expenditure to the detriment of quality, forgetting that of all costs, the greatest return is given by investments directed directly to the staff, to improve their working conditions.

A modern approach to creating shoes used abroad are characterized by three indispensable conditions under which shoes must:

ensure the declared safety of the carrier; to be reliable (good); be comfortable.

The latest conditions in the domestic special. shoes are practically not respected, and the methods of testing for ensuring safety should be significantly expanded in our country.

The aesthetic component is missing here, the need for which is dictated by the requirement - the creation of an attractive appearance of the special. shoes, which is especially important for female staff, otherwise it will be a negative irritant for the wearer.

The difference in approaches to the creation of special. shoes clearly demonstrates the comparison of the standards of international ISO and the Russian Federation (ISO, 20344: 2004 and domestic "Special footwear and materials for the top and bottom of special footwear").

The diagram (Figure 6) shows systematized quality indicators of special. shoes, where the plus sign (+) marks the indicators, the testing of which is provided for by the relevant ISO standard, and the Russian Federation and the minus sign (-) - not included in the testing procedures of the standards.

Consider the test methods carried out according to the ISO standard, but absent in domestic standards for special. shoes.

1. The ISO 20344 - 2004 standard provides special methods for evaluating the ergonomic characteristics of spec. shoes.

Three socks, shod in a properly selected special. shoes, perform the following tests:

- walk normally for 5 minutes at a speed of approximately 6 km/h; - go up and down stairs number 17 ± 3 in 1 min;
- kneel, squatting

After completing all the tasks, each shoe tester fills out the questionnaire given in table 5.

Carrying out this kind of simple tests gives a fairly objective idea of the ergonomic performance of the tested footwear and can serve as a barrier preventing the penetration of uncomfortable special equipment into the production shoes.

2. The ISO standard includes tests to determine the energy absorption of the heel part spec. shoes. This is a very important indicator that characterizes the shock-absorbing properties of shoes. Such devices reduce shock and quasi-shock loads that occur when the heel of the shoe comes into contact with a rigid support, such as a concrete floor. With insufficient depreciation, a significant reaction force arises, which is transmitted through the human musculoskeletal system, causing negative consequences.

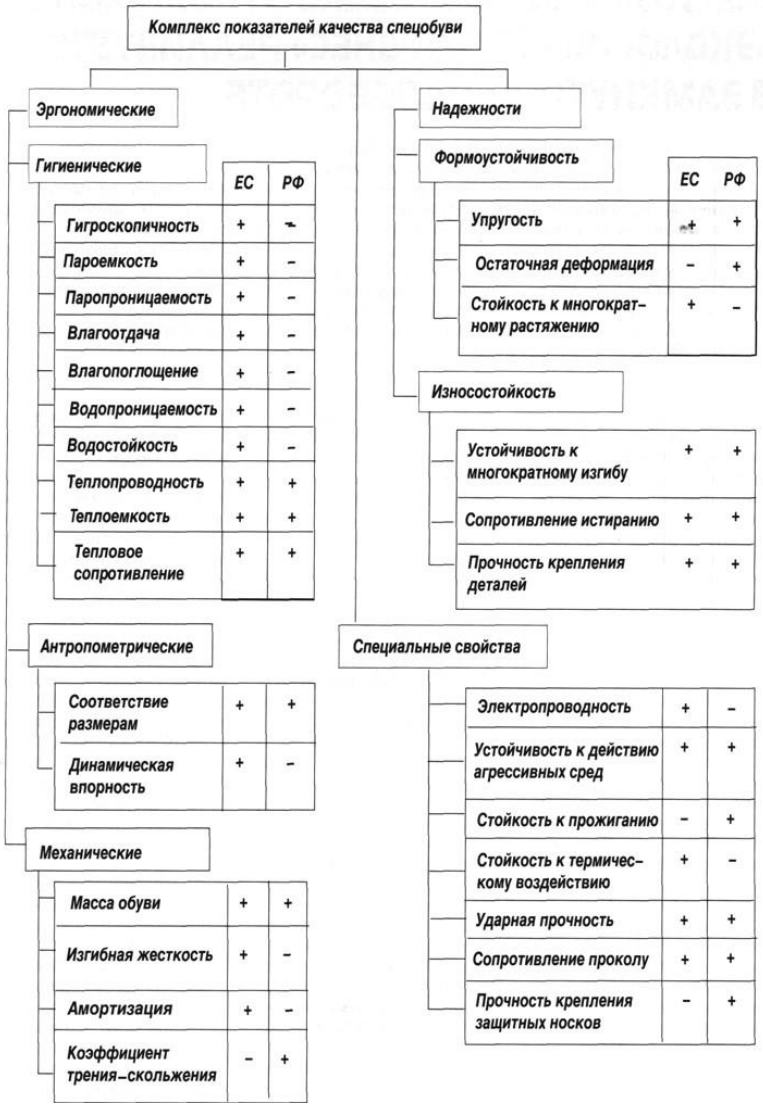

Figure 6. Safety footwear quality indicators

Table 5. Questions for evaluating ergonomic characteristics spec. shoes

1. Is the inside of the shoe free of rough edges, sharp protrusions, or hard spots that cause irritation or injury?	Yes	Not
2. Is the toe box or toe edge pinching or pinching?	Yes	Not
3. Does the shoe have any features that make it dangerous to wear?	Yes	Not
4. Is it possible to fasten the clasp on safety shoes conveniently and correctly?	Yes	Not
5. Is it possible to freely perform the following actions: walk, climb stairs, bend your knees, squat?	Yes	Not

3. The domestic standard (GOST 12.4.151–85) provides for the determination of the impact strength of only protective socks for special footwear.

In the ISO standards, special tests are established. shoes for impact strength not only of the toe part, but also of other areas of the shoe, which, when worn in production conditions, are subject to force effects that can cause injury to the foot if protection is not installed. So, in the ISO standard, the impact strength of the protective device for lifting the foot (between the metatarsal and shank parts) is determined.

4. The ISO standard provides for the determination of the impact absorption capacity of the ankle protection device connected to the top of the special. shoes.

The article voiced only some of the test methods according to the ISO 20344 - 2004 standard, but even from them you can see what attention manufacturers need to pay to the ergonomic and protective properties of the special. shoes.

About indicators for evaluating the quality of shoes

In modern conditions, with the general saturation of the market with consumer goods, the most acute problem is to ensure that the quality of the products offered meets consumer requirements. Among the consumer requirements for shoes, the group of ergonomic ones, defined by the concept of "comfort", is put forward in the first place in importance by the majority.

Certification tests of shoes are built on the basis of the current regulatory documentation, which sets out the technical requirements, methods for testing it to determine the main quality indicators. In support of the above, below are the quality indicators and test methods for their determination.

What is the Russian Quality Program? From the advertising materials of the organization it follows that it “reveals high quality products and services presented on the Russian market and informs consumers about them; gives the company the opportunity to prove to consumers that the quality of its products or services is significantly higher than the standard level; enables governments to purchase high quality products and services. The sign "Russian quality", the right to use which the company receives upon successful participation in the Program, becomes the most authoritative evidence of such quality. Based on the results of participation in the Program, the enterprise can present to interested parties as documents indicating high quality, not only a diploma, but also an assessment program and a report on its results.

The results of successful participation in the Program can be used when conducting marketing and advertising campaigns, when demonstrating your capabilities to clients and customers at exhibitions and fairs, as well as when participating in competitive bidding and tenders. To inform about products with the “Russian Quality” mark and diploma-winning enterprises of the Program, the following is provided:

holding all-Russian, regional and industry presentations

products awarded with the sign "Russian quality";

issue of all-Russian and industry catalogs "Russian Quality";

issue of the Russian Quality Program Bulletin;

placement on preferential terms of information about the company-diplomate and products on the website of the Program **www.roskachestvo.en** and other Internet resources;

participation on preferential terms of program diplomats in exhibitions and fairs held with the participation of the All-Russian Organization for Quality;

publications in industry, regional and all-Russian mass media”.

In accordance with the documents: “Regulations on the program “Russian Quality” of the CEP VOK No. RK-01-02 and “Regulations on the quality assessment programs used in the program“ Russian Quality ”CEP VOK No. RK-06-02, the Work Program No. RK- PR-CEP-47-02-05, which included the following points:

- product being valued;
- nomenclature of estimated product quality indicators, their acceptable and optimal values and scores corresponding to them;
- determination of the actual values of quality indicators;
- assessment of the ability of production to ensure the stability of product quality;
- conclusion on the conformity of product quality to the highest level.

The quality of the declared models of casual men's shoes was assessed in four groups: functional indicators (1),

characterizing the durability of products;

ergonomic indicators (2);

aesthetic indicators (3);

packaging and labeling quality indicators (4).

The first group includes such single indicators as:

- strength of thread fastenings of shoe upper blanks, N/cm with one line;
- strength of thread fastenings of shoe upper blanks, N/cm with two lines;
- sole fastening strength, N/cm;
- residual deformation of the toe, mm;
- residual deformation of the back, mm;

in the second group:

half-pair mass, g;

shoe flexibility, N/cm;

thermal resistance of the shoe top, m2 0C/W (for winter shoes);

thermal resistance of the bottom of footwear, m^2 0C/W (for winter footwear);

in the third:

silhouette, points;

appearance, points;

interior decoration, points;

in the fourth:

quality of marking;

packaging quality, points.

Permissible values of indicators, as well as their list itself, are established in accordance with GOST, indicated in table 7.

Table 7. Quality indicators and test methods for their determination

Quality indicator name	Test method (GOST, norm, etc.)
1	2
1. Shoes. Method for determining the total and permanent deformation of the toe and heel	GOST 9135–73
2. Shoes. Method for determining the strength of fastening soles in shoes of chemical fastening methods	GOST 9292–82
3. Shoes. Method for determining the strength of thread seams for connecting upper parts	GOST 9290–76
4. Shoes. Flexibility Method	GOST 9718–88
5. Shoes. Method for determining the strength of fastening parts of the bottom	GOST 9134–78
6. Shoes. Weight determination method	GOST 28735–90
7. Shoes. Method for determining the total thermal resistance of shoes	GOST 12.4.104–81
8. Shoes. Acceptance rules	GOST 9289–78
9. Shoes. Marking, packaging, transportation and storage	GOST 7296–81 GOST 16534–71
10. Shoes. Determination of grade	GOST 28371–89
11. System of quality indicators. Shoes. Nomenclature of indicators	GOST 4.12–81
12. Shoes. Terms and Definitions	GOST 23251–83
13. Shoes. Methods for determining linear dimensions	GOST 9133–78
14. Shoe lasts. Specifications	GOST 3927–88
15. Workshop on the technology of leather products. Ed. V.L. Rayackas. M., 1981.	
16. System for the development and production of products. Light industry products. Basic provisions	GOST15.007–88
17. Casual shoes. Specifications	GOST 26167–84
18. Shoes. Strength standards	GOST 21463–87
19. Shoemaker's Handbook. Technology. Moscow: Legprombytizdat, 1989.	

Let's turn to the second group of indicators. Obviously, such indicators do not provide an assessment of the complex characteristics of footwear (comfort) that interests the consumer, most of which are established empirically. Comfort depends on numerous factors, but the most significant are the design characteristics of shoe models and the properties of the materials used. The prospect of assessing the quality of shoes for the development of methods for assessing the quality of shoes should be associated with the use of CAD. Thus, the physical and mechanical properties of materials determine the force interaction of the foot with footwear, provide protection of the foot from the effects of the external environment and determine its microclimate. In this formulation of the question, the method of automated assessment of the comfort of shoes in terms of the physical and mechanical properties of upper material packages, developed at the Russian State University named after A.I. A.N. Kosygin.

The technique is implemented within the framework of the complex, the scheme of the software operation of which is shown in Figure 7.

Therefore, along with the selected groups of indicators, it seems appropriate to include another group "Comfort", the criteria of which, in our opinion, are the temperature and relative humidity of the internal space, the pressure of the upper shoe on the foot. The factors influencing the magnitude of shoe pressure on the foot are relative elongation, relative humidity and stiffness of material packages, for which we have established levels of variation and rational values based on the operating conditions and production of products.

The created instrumental system implements methods for automated assessment of shoe comfort and the formation of the most rational top packages in terms of physical and mechanical properties of materials and an express method for selecting shoe designs of a certain level of quality and purpose. The practical significance of the system lies in the reduction of the subjective factor in the selection, collection and ordering.

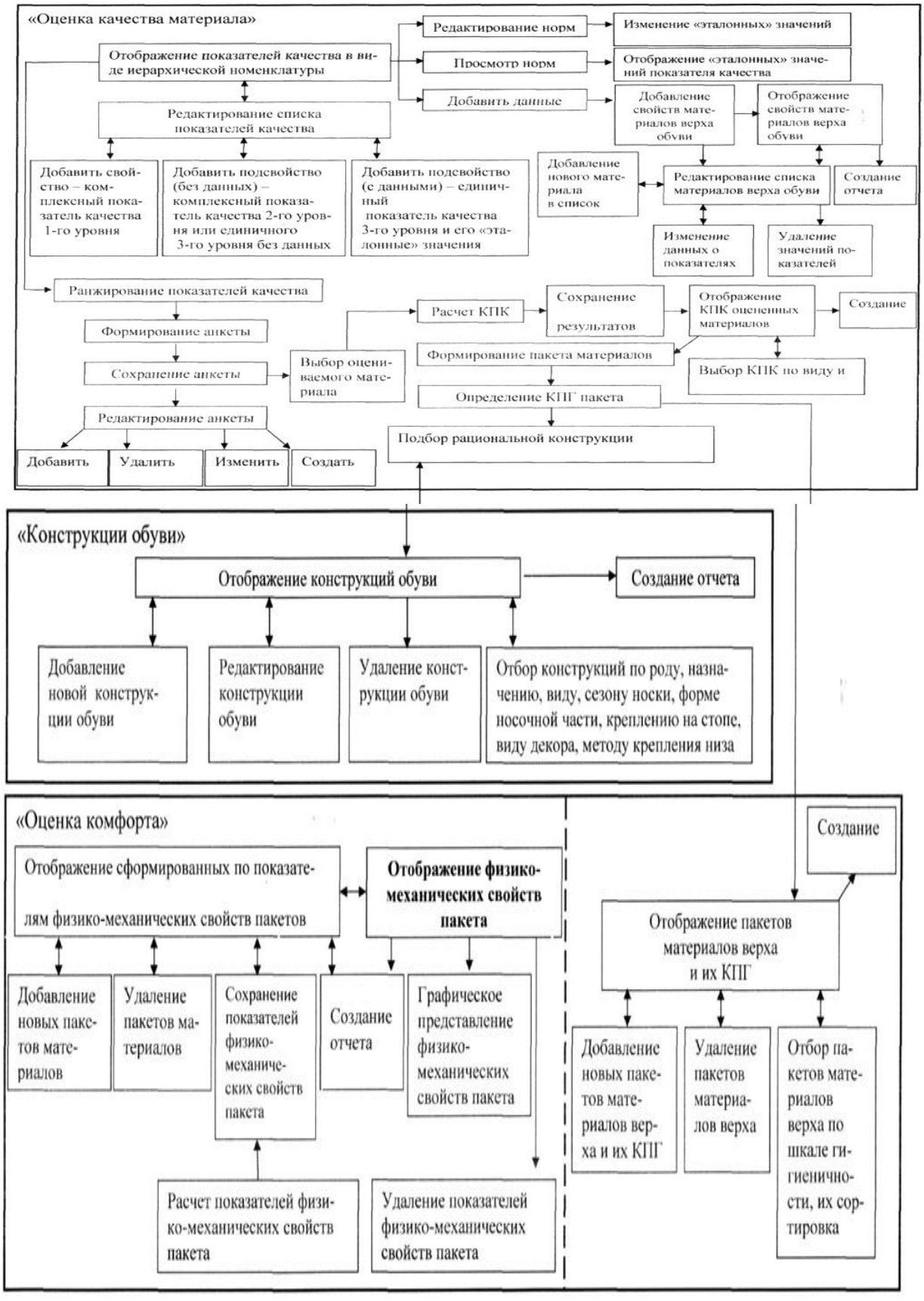

Figure 7. Scheme of work of the software of empirical indicators for evaluating the quality of products

Conclusion

The notion that takes place in management practice that inequality pushes people to increase performance results, that the state of equality demotivates people to achieve great results, is fundamentally wrong. As stated in the theory of equality based on empirical research, a person experiences a sense of satisfaction if equality is observed. Therefore, he strives to maintain this state.

Equality is bad when the overall level of performance is low. In this case, equality will lead to the preservation of this level. If the overall level of performance is high, equality is an important motivating factor for the success of the members of the organization.

In the event that an individual believes that he is not sufficiently or excessively rewarded, he has a feeling of dissatisfaction (in the second case, this feeling is less pronounced). Considering an unfair and unequal assessment of his work, a person loses motivation for active creative actions, in terms of the goals of the organization, which leads to many negative consequences.

The theory of equality allows us to draw several very important conclusions for the practice of managing people in an organization. Since perception is subjective, it is very important that information be widely available about who, how, for what and how much is rewarded. It is especially important that there is a clear system of payment that answers the question of what factors determine the amount of payment. An important conclusion from the theory of equality is that people are guided by a complex assessment of remuneration. Wages play an important role in this comprehensive assessment, but far from being the only and not necessarily decisive. Therefore, managers should take this into account if they are trying to create an atmosphere of equality in the team.

As repeatedly emphasized, the perception of equality and fairness is highly subjective. To successfully manage people, a manager must not only strive to be fair, create an atmosphere of equality, but also know well whether employees believe that remuneration is built on an equal and fair basis. To do this, management should regularly conduct research to find out how employees evaluate remuneration, whether they consider it equal or not.

A person in an organization manifests himself not only as a performer of a certain job or a certain function. He shows interest in how his work is organized, in what conditions he works, in how his work affects the activities of the organization. That is, he has a natural desire to participate in the processes taking place in the organization that are related to his activities in the organization, but at the same time go beyond his competence, beyond the scope of his work and the tasks he solves.

The concept of participatory management proceeds from the fact that if a person in an organization is interested in participating in various intra-organizational activities, then he thereby, receiving satisfaction from this, works with greater efficiency, better, more efficiently and productively, namely:

firstly, it is believed that participatory management, opening the employee access to decision-making about issues related to his functioning in the organization, motivates a person to do his job better;

Secondly, participatory management not only contributes to the fact that the employee is better at his job, but also leads to greater returns, a greater contribution of the individual employee to the life of the organization, i.e. there is a fuller use of the potential of the human resources of the organization.

Initially, the spread of participatory management was associated only with improving the motivation of workers. Recently, participatory management is increasingly associated with improving the use of the full potential of the organization's human resources. Therefore, the concept of participatory management can no longer be associated only with the process of motivation, but should be considered as one of the general approaches to managing a person in an organization. Participatory management can be implemented in the following areas, namely:

firstly,workers are given the right to make their own decisions about how they carry out their activities. Autonomy may concern, for example, such aspects of their activities as the mode of operation or the choice of means for carrying out work;

Secondly, workers may be involved in making decisions about the work they perform. In this case, the manager consults with the employee about what to do and how to perform the tasks assigned to him. That is, in other words, the employee is involved in setting goals that he has to achieve, determining the tasks that he will have to solve;

third, employees are given the right to control the quality and quantity of their work and, accordingly, responsibility for the final result is established;

fourth, participatory management involves the broad participation of employees in rationalization activities, in making proposals for improving their own work and the work of the organization as a whole, as well as its individual divisions;

fifth, a possible direction for the implementation of participatory management is to give employees the right to form working groups from those members of the organization with whom they would like to work together. In this case, the right to make a decision is given not only about the member's own work, but also about with whom to cooperate in group activities.

In real practice, all these areas of participatory management are usually used in a certain combination, since they are very closely related to each other and complement each other very well.

Moreover, it is in combination with each other that these separate directions can effectively manifest themselves, and it is precisely the individual well-established combinations of these directions that are used as specific forms of participatory management. The most obvious example of this is the quality circles widely used in the management of Japanese firms.

A person performs certain actions in accordance with the pressure on him of a combination of internal and external forces in relation to him. The totality of these forces, called motivation, evokes far from the same reaction in people. Therefore, it is impossible to unambiguously describe the process of motivation. At the same time, on the basis of empirical research, several concepts have been developed that describe the factors influencing motivation and the content of the motivation process.

So-called content theories of motivation focus on how different groups of needs affect human behavior. The widely accepted concepts of this group are Maslow's hierarchy of needs theory, Alderfer's ERG theory, Herzberg's two-factor theory, and McClelland's acquired needs theory. Despite the fundamental differences between these concepts, they nevertheless have something in common at their core, which reflects a certain commonality in the motivation of a person to act.

The process of motivation is revealed in theories that try to explain why people are willing to perform certain actions, spending more or less effort. Expectancy theory, goal setting theory, equality theory and participatory management theory, explaining how people should be influenced in order to encourage them to perform effectively, give managers the key to building an effective system of motivating people to effective results of their activities.

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	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS
International Scientific Journal
Theoretical & Applied Science
p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)
Year: 2023 **Issue:** 03 **Volume:** 119
Published: 29.03.2023 **http://T-Science.org**

Issue Article

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MODELING AND SYNTHESIS OF VOLTAGE REGULATORS FOR RENEWABLE ENERGY GENERATORS WITH DELAY ACCOUNTING

Abstract: *The article deals with modeling a model of a voltage regulator for renewable energy generators with taking into account the delay. The results of the research made it possible to identify the main modes of the system's behavior: a trivial attractor, a stationary regime, limit cycles of the Poincaré type, dynamic chaos, destructive changes - the "black hole" effect. These models can be used to analyze the functioning of voltage regulators in transient and emergency modes.*

Key words: *controller, mathematical modeling, nonlinear dynamics, transfer function, energy, functional differential equations.*

Language: *Russian*

Citation: Hidirova, M., & Abdurahmanova, S. (2023). Modeling and synthesis of voltage regulators for renewable energy generators with delay accountiNG. *ISJ Theoretical & Applied Science, 03 (119),* 245-250.

Soi: http://s-o-i.org/1.1/TAS-03-119-32 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.32

Scopus ASCC: *2604.*

МОДЕЛИРОВАНИЕ И СИНТЕЗ РЕГУЛЯТОРОВ НАПРЯЖЕНИЯ ГЕНЕРАТОРОВ ВОЗОБНОВЛЯЕМОЙ ЭНЕРГИИ С УЧЕТОМ ЗАПАЗДЫВАНИЯ

Аннотация: *Рассмотрен вопрос разработки модели регулятора напряжения генераторов возобновляемой энергии с учетом запаздывания. Результаты исследований позволили выявить основные режимы поведения системы: тривиального аттрактора, стационарного режима, предельных циклов типа Пуанкаре, динамического хаоса, деструктивных изменений – эффект «черная дыра». Данные модели могут быть использованы для анализа функционирования регуляторов напряжения в переходных и аварийных режимах.*

Ключевые слова: *регулятор, математическое моделирование, нелинейная динамика, передаточная функция, энергия, функционально-дифференциальные уравнения.*

Введение

Развитие альтернативных источников энергии становится в последнее время всё значимее и перспективнее [1-10]. Для повышения эффективности применения чистой энергии важно добиться устойчивого функционирования энергосистемы в условиях неопределенности генерации возобновляемой энергии, изменения характеристик внешних и внутренних условий и факторов. Одной из важных проблем внедрения зелёной энергетики является низкое и нерегулируемое выходное напряжение генераторов альтернативных источников энергии, неустойчивость в работе при сильных пульсациях [1-4]. Преобразователи напряжения должны иметь высокий коэффициент усиления по напряжению,

низкие пульсации входного тока и высокий КПД. Обычный повышающий преобразователь был предложен для возобновляемых источников энергии; однако для достижения высокого коэффициента усиления по напряжению требуются большие рабочие циклы. Вышеупомянутое приводит к большим скачкам напряжения, проблемам со временем обратного восстановления диода и высоким потерям проводимости на активном переключателе из-за собственных сопротивлений [5]. В работе [6] предлагается повышающая схема с квадратичным коэффициентом преобразования и непоследовательной передачей мощности, состоящая из двух обычных повышающих преобразователей с двумя активными ключами, работающими с одинаковым рабочим циклом и в предлагаемой конфигурации используется передаточный конденсатор, чтобы избежать повторной обработки мощности между обоими преобразователями. Авторы работы [11] отмечают, что сложная модель энергосистемы может быть аппроксимирована более простыми моделями, что позволяет применить хорошо апробированную теорию оптимального управления линейными объектами. Исследователям удалось синтезировать эффективный комбинированный регулятор, состоящий из двух регуляторов, настроенных на работу при различных нагрузках. Но, несмотря на огромные успехи, все еще не созданы регуляторы, обладающие обобщающей и «думающей» способностью, особенно в условиях быстро-изменяющейся энергетической и информационной среды [11-13].

МЕТОДЫ ИССЛЕДОВАНИЯ

Классическая модель преобразователя напряжения в устройствах генерации возобновляемой энергии имеет вид [6]:

$$L\frac{di}{dt} = -(1-u_{01})V + E;$$
$$C\frac{dV}{dt} = (1-u_{01})i - \frac{V}{R}.$$

Здесь E – энергия источника питания, L – индуктивность катушки, i – ток, V – напряжение, C – ёмкость конденсатора, R – сопротивление резистора, $u_{01} \in [0,1)$.

Передаточную функцию преобразователя напряжения можно принять в следующем виде:

$$W(s) = \frac{\frac{V}{LC}}{s^2 + \frac{1}{RC}s + \frac{1}{LC}}.$$

Задача структурно–параметрической оптимизации (место включения, структура и настроечные параметры регулятора) является важной для качества и эффективного устойчивого функционирования энергосистемы в условиях неопределенности генерации возобновляемой энергии, изменения характеристик внешних и внутренних условий и факторов. Преобразователи напряжения обладают также запаздыванием, т.е. изменение выходной координаты начинается не одновременно с приложением воздействия, а спустя некоторое время τ, что ухудшает их устойчивость и влияет на выбор структуры и параметров регулятора. Передаточную функцию преобразователя напряжения с учетом запаздывания можно принять в следующем виде:

$$W(s) = \frac{\frac{V}{LC}e^{-s\tau(t)}}{s^2 + \frac{1}{RC}s + \frac{1}{LC}}.$$

Таким образом, из-за накопления энергии в реактивных элементах, таких как индуктивности и ёмкости, в реальных системах могут наблюдаться запаздывания, что также влияет на характер переходных процессов при воздействиях (рис 1).

Для обеспечения постоянства напряжения в устройствах генерации возобновляемой энергии используются электронные регуляторы на микропроцессорной основе. ПИД-регуляторы нашли широкое применение в электронных регуляторах напряжения, где очень важно не допустить перенапряжений [13-15]. Передаточная функция ПИД-регулятора определяется выражением:

$$W(s) = K_p + \frac{K_i}{s} + \frac{sK_d}{1+Ts},$$

где K_p, K_i, K_d – коэффициенты усиления пропорциональной, интегральной и дифференциальной составляющих регулятора, соответственно, T – постоянная времени дифференцирования.

Настройка коэффициентов ПИД-регулятора является не простой задачей, требуется определить коэффициенты для трех составляющих для достижения заданных требований по времени установления и перерегулирования. Авторы работы [16] заявляют об эффективности использования нейросетевого оптимизатора параметров ПИД-регулятора к колебаниям нагрузки и шуму. В структурах преобразования напряжений из-за своей простоты реализации и более низкой стоимости хорошо рекомендовал себя алгоритм Antlion Optimization (ALO) для ПИД-регулятора, который даёт гораздо лучшие результаты с более быстрой динамикой

[17]. Адаптивный нейро-нечеткий (ANFIS) самонастраивающийся ПИД-регулятор, а также гибридные ПИД-регуляторы обладают эффективными характеристиками, позволяющими быстро и надежно следовать схеме опорного напряжения при внешних изменениях нагрузки, распределениях и неопределенности параметров [18-19]. Исследователи также рассматривают подход к синтезу систем управления для уравнений Ван дер Поля и Лоренца на основе динамических обучаемых многослойных нейронных сетей. Исследователи используют различные модели осцилляторов, таких как осцилляторы Ван дер Поля, Курамото, Вилсона-Коуэна, Лоренца, Росселя и других [20-21].

Однако, имеющиеся регуляторы с системами искусственного интеллекта не предназначены для осуществления сложных «мыслительных» процессов с временными взаимоотношениями, кооперативными процессами и комбинированными обратными связями в условиях неопределенности генерации возобновляемой энергии, изменения характеристик внешних и внутренних условий и факторов. Также необходимо отметить, что ни одна исследовательская группа в мире, которая пытается выращивать сознание на небиологическом носителе, не приблизилась сегодня к созданию искусственного интеллекта, который обладал бы одновременно всеми свойствами, которые присущи человеческому интеллекту. Б.Н. Хидировым были разработаны методы количественных исследований сложных колебательных регуляторных систем, позволяющих с единой позиции рассматривать широкий круг явлений, объединенных наличием регуляторной системы, среды регуляции, конкуренции, кооперации и комбинированной обратной связи [22]. Было введено понятие ***ORASTA***, состоящее из *осциллятора-регулятора* ***(OR)***, способного принимать, перерабатывать и передавать сигналы определенной природы, и активной среды с временной постоянной (*active system* with *time averadge* – ***ASTA)***, позволяющей осуществлять петлю обратной связи в системе за конечное время. Одна из основных идей при математическом моделировании «думающих» регуляторов заключается в центральном регулировании потоками информации на основе мультиосцилляторной ***ORASTA***. *Осциллятор-регулятор* ***(OR)*** способен принимать, обрабатывать и передавать информационные сигналы. Здесь наиболее важным и детально не изученным является вопрос регуляторных механизмов обработки сигнала (ассоциация, индукция, дедукция, анализ, синтез, обобщение, конкретизация).

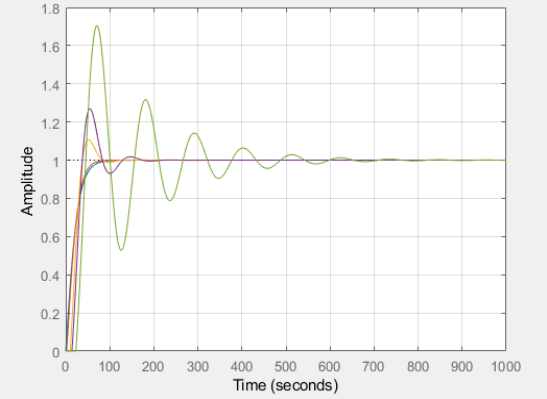

Рис. 1 Влияние запаздывания (задержки на 5с, 10с, 15с, 20с) на характер переходных процессов модели преобразователя напряжения с учетом запаздывания с обратной связью на входной сигнал в виде единичной ступеньки

Пусть в некотором ограниченном объеме существует N взаимосвязанных элементов – регуляторов, способных к восприятию, переработке и синтезу сигналов определенной природы. Пусть $X_i(t)$ – величина безразмерная, характеризующая количество синтезируемого сигнала, соответствующего i-му элементу в момент времени t $(1 \leq n, \quad n \leq N)$. Взаимосвязь между регуляторами осуществляется посредством сигналов со средним временем прохождения петли обратной связи h (т.е. временем, прошедшим с момента образования сигналов до момента воздействия их (или их продуктов) на активность регуляторов). Требуется проведение анализа наиболее простейших закономерностей возникновения, развития и деформации осцилляторного фона при восприятии, переработке и синтезе смысловой информации данными элементами. Можно рассматривать регуляторные уравнения с запаздывающими аргументами, смешанные уравнения и уравнения типа пантографа:

1. Функционально-дифференциальные уравнения регуляторики с запаздыванием

$$\frac{dX_i(t)}{dt} = a_i\left(\prod_{k=1}^{n} X_k(t-h)\right) e^{-\sum_{k=1}^{n}\delta_{ik}X_k(t-h)} - b_i X_i(t)$$

2. Функционально-дифференциальные уравнения регуляторики с запаздыванием и опережением

$$\frac{dX_i(t)}{dt} = a_i\left(\prod_{k=1}^{n} X_k(t-h)X_k(t+h)\right) e^{-\sum_{k=1}^{n}\delta_{ik}X_k(t-h)X_k(t+h)} - b_i X_i(t)$$

3. Функционально-дифференциальные уравнения регуляторики со сжатием и растяжением

$$\frac{dX_i(t)}{dt} = a_i\left(\prod_{k=1}^{n} X_k(th)\right) e^{-\sum_{k=1}^{n}\delta_{ik}X_k(th)} - b_i X_i(t)$$

Для исследования вопросов самоорганизации, саморегуляции и адаптации регуляторов для достижения устойчивого функционирования в процессе обработки внешних и внутренних информационных потоков необходимо изучение ассоциативных, взаимосопряженных и самосопряженных регуляторных связей между элементами системы.

Таким образом, для моделирования нейро-регуляторов на основе осцилляторных рекуррентных нейронных сетей наиболее оправданным и актуальным является построение их с помощью систем функционально-дифференциальных уравнений с памятью, поскольку они обладают «врожденными» колебательными режимами и позволяют учитывать временные взаимоотношения, то есть принимается решение как с учетом текущих входных данных, так и входных данных, полученных ранее с функцией саморегуляции.

ОБСУЖДЕНИЕ РЕЗУЛЬТАТОВ

Таким образом, используя методику регуляторики построен нейро-регулятор с учетом временных взаимоотношений, кооперативных процессов и комбинированных обратных связей на базе функционально-дифференциальных уравнений с запаздыванием [22]. Компьютерные исследования позволяют оперативно оценивать общую закономерность, характерные черты и основные режимы поведения решений. Они позволяют получать приближенные решения нелинейных функционально-дифференциальных уравнений регуляторики, оценивать поведение нерегулярных решений и уровень их «хаотичности», проводить анализ закономерностей процессов извлечения смысла из информационного потока путем «вычислительных экспериментов» для устойчивого функционирования энергосистемы в условиях неопределенности генерации возобновляемой энергии. При исследовании наиболее основных механизмов функционирования регуляторов при извлечении смысла из принятого огромного количества информации, сортировки и обработки «полезной» и «вредоносной» информаций выявлено, что данные процессы реализуются посредством сложных циклических регуляторных механизмов путем выявления связей между сигналами, выделения основных частот колебаний и распределения энергии по частотам. Разработанное программное средство допускает изменение значений параметров, детализацию и временную остановку для архивизации визуального материала. На основе качественных исследований модельных уравнений регуляторов показано что, при отсутствии нетривиального положения равновесия, тривиальное положение равновесия устойчиво, при пересечении бифуркационной точки, происходит мягкое возбуждение системы и переход в устойчивое нетривиальное положение равновесия. Дальнейший рост точки бифуркации может привести к потере устойчивости и появлению колебаний вокруг нетривиального положения равновесия у модельного уравнения (рис. 2).

На основе результатов качественных исследований и вычислительных экспериментов возможно построение параметрического портрета модельных систем нейро-регулятора с выделением конкретных областей однотипного поведения: тривиального аттрактора, стационарного режима, предельных циклов типа Пуанкаре, динамического хаоса, деструктивных изменений – «черная дыра» с целью анализа закономерностей функционирования рассматриваемой системы при переходных и аварийных ситуациях.

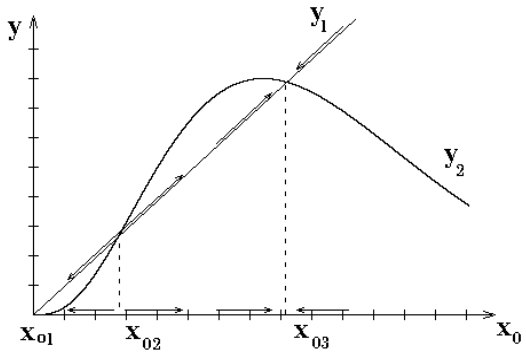

Рис. 2. Существование аттрактора у модельной системы регулятора

$(y_1 = x,\ y_2 = (a/b)x^2 \exp(2(1-x)))$

Более подробное изложение результатов моделирования электронных нейро-регуляторов напряжения мехатронных систем с учетом запаздывания планируется в последующих публикациях.

ЗАКЛЮЧЕНИЕ

Таким образом, для моделирования электронных регуляторов напряжения генераторов альтернативных источников энергии с учетом запаздывания наиболее оправданным и актуальным является использование хаотических искусственных нейронных сетей со сложной функцией активации с самообучением и обобщением. Особенно это актуально при разработке энергетических систем в условиях неустойчивости в работе при сильных пульсациях и когда очень важны вопросы экологии, безопасности и эффективности. Созданную нейронную сеть необходимо не обучать, а образовывать, то есть формировать навык иерархически оперировать понятиями экологичности, безопасности и эффективности при центральном регулировании потоками энергии и информации.

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	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS
International Scientific Journal
Theoretical & Applied Science
p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)
Year: 2023 **Issue:** 03 **Volume:** 119
Published: 30.03.2023 **http://T-Science.org**

Issue Article

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DETERMINATION OF THE PATHOLOGICAL CHANGES' DISTRIBUTION IN DIFFERENT PARTS OF THE LIVER BY RADIOLOGICAL METHODS IN PATIENTS WITH DIABETES MELLITUS

Abstract: *As a result of the development of the technical capabilities of various radiological methods, their application in a number of fields of medicine has been expanded. The purpose of the study was to study the sensitivity and specificity of various radiological methods in the diagnosis of metastases and cysts in certain parts of the liver in patients with diabetes. In order to quantitatively and qualitatively study the cysts in the liver of patients with and without fatty liver by MRI, MSKT and USM methods, a 3-stage research plan was prepared. We were able to identify 17 out of 18 patients with metastases who had changes in the contours of their liver during the MRI examinations. As a result of examinations with the appropriate method, out of 38 patients without liver contour changes, it was determined that 2 people had changes in the liver contours by mistake. Using the indices, TPR (sensitivity)= 0.9444, TNR (specificity)= 0.9473, ACC (accuracy)= 0.9464, PPV (positive predictive value)= 0.8947 and NPV (negative predictive value)= 0,9729 were also obtained.*

Key words: *diabetes, fatty liver, MRI, USM, MSCT, metastasis, cyst, sensitivity.*
Language: *English*
Citation: Sultanova, M. J., & Najafova, V. N. (2023). Determination of the pathological changes' distribution in different parts of the liver by radiological methods in patients with diabetes mellitus. *ISJ Theoretical & Applied Science, 03 (119)*, 251-254.
Soi: http://s-o-i.org/1.1/TAS-03-119-33 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.33
Scopus ASCC: *2700.*

Introduction

Relevance: Focal fatty infiltration of the liver and focal fatty liver dystrophy are the most common benign liver pathologies in clinical practice, and this problem occupies an important place in the technical research of liver pathologies in the world. [5,6,8]. Fatty dystrophy of the liver (fatty hepatosis) occurs as a result of metabolic disorders in the gland, including lipid metabolism. Fatty hepatosis is a widespread chronic pathology [2]. It is also observed that the disease develops at an early age. Diagnosis of liver hemangiomas is mainly carried out by radiological methods.

In the process of differentiation of focal malignant and benign liver lesions conditions such as focal fatty infiltration and dystrophy cannot be effectively diagnosed by methods such as ultrasound (US) and computed tomography (CT), which, therefore, leads to the need for such diagnostic methods, like magnetic resonance imaging (MRI) or biopsy. [1,9,11]. Contrast computed tomography (CT) is used to further clarify the diagnosis. Nevertheless, during this technique, the radiation is relatively high, and a number of undesirable effects may arise as a result of the injection of contrast material [3,7].

As a result of the development of technical capabilities in ultrasonography and contrast agents,

the application of the contrast ultrasonography (CUS) method has been expanded, and it shows high specificity in detecting liver hemangiomas, along with traditional US, contrast-enhanced ultrasound examination, contrast-enhanced computed tomography, magnetic resonance tomography, angiography, multispiral computed tomography (MSCT) [4,10,12].

The **purpose of the study** was to assess the sensitivity and specificity of various radiological methods in the diagnosis of metastases and cysts in certain parts of the liver in patients with diabetes mellitus.

Materials and methods of the study: A 3-stage plan of the study was prepared in order to quantitatively and qualitatively study the cysts in the liver of patients with and without obesity by MRI, MSCT and US methods. In the first stage, 22 people without symptoms of fatty dystrophy in the liver (conditionally control group) and 14 people with II grade fatty dystrophy in the liver (conditionally main group) were included in the study (in total 36 patients with cysts in the liver). The number and sizes of cysts in patients were determined by MRI.

In the second phase of the study, 16 people without liver fatty dystrophy and 12 patients with II degree fatty dystrophy of the liver, (in total of 28 people with liver cysts) were included in the study. Quantitative and qualitative analysis of cysts was performed by MSCT method.

14 people without liver fatty dystrophy and 12 people with grade II fatty dystrophy (in total 26 patients with liver cysts) were included in the 3rd stage of the study. Quantitative and qualitative analysis of cysts in relevant patients was performed by US method. For each stage of the study, the results we obtained are given by the absolute number of patients in the group and percentage.

Indicators such as sensitivity (true positive rate - TPR), specificity (true negative rate - TNR), accuracy (ACC), positive predictive value (PPV) and negative predictive value (NPV) were studied in determining various signs in the liver. It should be noted that the patients we involved in the process during the different stages of the research were not different, but in many cases the same patients.

The statistical processing of the results obtained during the research work was carried out with the Statistica 7.0 application computer program.

Results of the study. In the phase where we determined in which part of the liver the cysts were located in different research groups with and without fatty dystrophy in the liver using radiological methods such as MRI, CT and USM, in the group of patients without fatty dystrophy (n=30), in 60% of cases liver cysts were located in the left lobe of the liver (were determined by MRI). At this time, in the research group (n=21) who had grade II fatty dystrophy in the liver and used the MRI method for examination, the cases of cyst localization in the left lobe made up 57.1% of cases.

In the group of patients (n=20) who did not have any signs of steatosis in the liver, where we performed CT examinations, the percentage of cysts location in the left lobe of the liver was 40%. In the group (n=16) with grade II steatosis in the liver, the percentage of cases of cysts' localization in the left lobe were 43.8% of the total cases (found out by CT method) (table 1).

Table 1. Distribution of cysts in different parts of the liver as a result of examinations carried out by MRI, CT and US methods (%).

Localization of the cysts	Radiological methods					
	MRI		CT		US	
	Metastases (%)	Steatosis and metastases (%)	metastases (%)	Steatosis and metastases (%)	Metastases (%)	Steatosis and metastases (%)
Left lobe	60,0	57,1	40,0	43,8	33,3	43,8
Right lobe	30,0	23,8	20,0	12,5	38,1	37,5
Caudate lobe	6,7	14,3	15,0	6,3	19,0	12,5
Quadrate lobe	3,3	4,8	25,0	37,5	9,5	6,3
Total	30	21	20	16	21	16

During the detection of cysts in the left lobe of the liver by the US method, the percentage of cysts in the left lobe of the liver in the group without steatosis (n=21) made up 33.3% of the total cases in the group. Nevertheless, in the group with grade II fatty dystrophy in the liver, the incidence of cyst localization in the left lobe of the liver was 43.8%.

As a result of the study, in the group of patients who did not have fatty dystrophy in the liver(n=40), we found that in 22.5% of cases, the metastases were mainly located in the caudal lobe of the liver (Table

2). At the same time, in the group with fatty dystrophy in the liver (n=23) when we used the MRI method for examination, the cases of localization of metastasis foci in the corresponding lobe of the liver covered 26.1% of the total cases in the group.

Table 2. Distribution of metastases in different parts of the liver as a result of examinations carried out by MRI, CT and US methods (%).

Localization of the metastases	Radiological methods					
	MRI		CT		US	
	Metastases (%)	Steatosis and metastases (%)	metastases (%)	Steatosis and metastases (%)	Metastases (%)	Steatosis and metastases (%)
Left lobe	47,5	43,5	34,0	29,7	37,1	44,4
Right lobe	30,0	30,4	24,0	21,6	25,7	25,9
Caudate lobe	22,5	26,1	20,0	24,3	20,0	14,8
Quadrate lobe	0,0	0,0	22,0	24,3	17,1	14,8
Total	40	23	50	37	35	27

At the stage of determining the localization of metastases in the caudal lobe of the liver in the groups of patients with and without steatosis by CT examination, in the group of patients with grade II steatosis of the liver (n=37) it was recorded that metastases spread to the corresponding lobe of the organ in 24.3% of cases. But in the group without fatty dystrophy (n=50) CT method showed that the appearance percentage of metastasis foci in the caudal lobe was 20%.

Of the 161 patients with liver metastases (in 57 they were found out by US, in 48 - by MSCT, and in 56 – by MRI) at the 2nd stage we determined sensitivity (TPR), specificity (TNR), accuracy (ACC), positive predictive value (PPV) and negative prognostic value (NPV) according to the sign of liver contour changes. As a result, in the group in which we chose ultrasound as the examination method (n = 57), when using other examination methods, 23 people were confirmed that they really had changes in the contour of the liver, and 34 people did not have this symptom (P = 23, N=34). Nevertheless, after the research objects in the relevant group were involved in US examinations, 22 of the 23 patients with contour changes in the liver, but not all of them, had contour changes, but the relevant case of 1 person was not recorded (Table 3). In addition, 2 out of 34 patients without liver contour changes were shown to have false contour changes (false positive results). Considering these cases, it would be appropriate to note following indicators: TP (true positive)=22, FP (false positive)=2, FN (false negative)=1 and TN (true negative)=32 (table 3). By entering the relevant indicators into the necessary formulas, TPR (sensitivity)= 0.9565, TNR (specificity)= 0.9411, ACC (accuracy)= 0.9473, PPV (positive predictive value)= 0.9166 and NPV (negative predictive value)= 0.9696 was determined.

Table 3. Prognostic value indicators according to the sign of changes of liver contours in the application of radiological methods.

	P	N	TP	FP	FN	TN	TPR	TNR	ACC	PPV	NPV
US (n=57)	23	34	22	2	1	32	0,9565	0,9411	0,9473	0,9166	0,9696
MSCT (n=48)	17	31	16	2	1	29	0,9411	0,9354	0,9375	0,8888	0,9666
MRT (n=56)	18	38	17	2	1	36	0,9444	0,9473	0,9464	0,8947	0,9729

Among the 56 patients in the group of patients with metastases in the liver, in which we used the MRI method, when using other examination methods, 18 were confirmed that they really had changes in the contour of the liver, and 38 of them did not have this symptom (P=18, N=38). In the relevant group, we were able to identify 17 out of 18 patients with metastases who had changes in the contours of the liver during the MRI examinations. As a result of examinations with the appropriate method, out of 38

patients without liver contour changes, it was determined that 2 people had changes in the liver contours by mistake. Thus, it is determined that TP=17, FP=2, FN=1 and TN=36.

Using these indicators, TPR (sensitivity)= 0.9444, TNR (specificity)= 0.9473, ACC (accuracy)= 0.9464, PPV (positive predictive value)= 0.8947 and NPV (negative predictive value)= 0.9729 were obtained.

Thus, In patients with diabetes mellitus and fatty dystrophy with liver metastases, hemangiomas, cysts, and other pathological foci, along with the combination of several radiological methods, their specificity indicators should be taken into account.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.771	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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THE IMPORTANCE OF INNOVATIVE ACTIVITIES IN THE CONSTRUCTION INDUSTRY

Abstract: *The article discusses some areas of activation of innovation activity in the investment and construction sector. Innovation is presented as one of the main driving forces contributing to the competitiveness and economic growth of the country.*

Key words: *Innovative activities, construction, new technologies, national economy.*

Language: *English*

Citation: Buranova, N., Rashidova, M., Atadjanova, S., & Azimova, Ch. (2023). The importance of innovative activities in the construction industry. *ISJ Theoretical & Applied Science, 03 (119),* 255-257.

Soi: http://s-o-i.org/1.1/TAS-03-119-34 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.34

Scopus ASCC: *1400.*

Introduction

The further movement of Uzbekistan along the innovative path of development puts forward the need for qualitative changes in all spheres and sectors of the national economy, including construction. In solving this important task, a special place belongs to the creation of an effective innovation management system for the primary links of the construction complex, both at the national level and in a separate region. The actual implementation of this provision is largely determined by the state of scientific support, reflecting new approaches, principles and management methods adequate to modern production and economic activity.

The well-known American scientist A.Taffler noted that no problem faced by the company is more important and complex than the problem of innovations, the Japanese company Toshiba, presenting its products, asserts: "Innovation is a journey, not an end goal"[1]. Currently, there is a tendency in the world to form a knowledge-based economy, primarily related to the social orientation of new technologies in various fields, including the creation and use of new materials and nature-saving technologies.

Special attention is paid to international cooperation in the field of innovation, in particular, the work of joint working groups on innovation with France, the Netherlands, and Austria has been launched. The tasks of innovative development can be solved only in close cooperation with the main participants of the global innovation process[2].

Innovative processes are also reflected in the construction complex of the Republic of Uzbekistan. A new production facility for the production of modern building materials has been put into operation in the republic. In particular, such as drywall, dry mixes, aluminum radiators, plastic panels for walls and ceilings, aluminum-polymer composite panels for facades, metal and ceramic tiles, etc. And the production of door and window blocks, plastic pipes are also growing. The scale of construction works is expanding in our republic. Significant amounts of innovative activity are carried out within the framework of the adopted state programs for modernization, technical and technological re-equipment of production facilities and localization [3].

The problem of increasing innovation activity and restoring the potential of the country's construction complex has become most acute. Innovative activity in construction, ensuring the creation and use of new, more advanced and efficient means of production (construction machines and mechanisms, building materials, products, structures, new technologies in design and construction, etc.) contributes to the development of the national economy as a whole [4]. Innovations in construction are understood as the process of introducing into the construction production system the results of scientific and technological progress in the field of new equipment and technology, design developments, progressive methods of organization and management of construction, ensuring an increase in the efficiency of construction production, improving the quality of construction products and increasing its competitiveness.

Construction is represented by various types of work and a variety of technological processes, so there can be many types of innovations in it: innovations used in the design process, the innovativeness of the objects themselves (buildings and structures), new construction technologies, new methods of organization and management in construction, etc[5].

The development of progressive models for managing the innovative development of construction enterprises should proceed from the intensity of innovation processes, reducing the time for creating innovations, as well as changes in the functions and composition of participants in innovation activities. New approaches to its formation are determined by changes caused by a decrease in the governing role of the state in the innovative development of many industries, on the one hand, and the nomination of enterprises and firms as the main participants in this process, on the other. At the same time, the main task of the company's policy is the growth of innovation activity in order to increase competitiveness. At the same time, entering international markets that select competitive technologies exacerbates the problem of modernization and formation of innovation systems at enterprises that are forced to integrate into the global innovation system[6]. The experience of developed countries shows that with the increase in the scale of scientific and technical activities in the field of production, the volume of work associated with the interaction of various economic entities increases. Such subjects are other construction enterprises, enterprises of the construction materials industry, research and design institutes, higher educational institutions.

Among the directions of innovative business in construction, the following can be distinguished[7]:

a) the purchase of advanced foreign technologies and the organization of production of new products;

b) purchase of advanced materials, machinery and equipment for construction organizations;

c) purchase of domestic and foreign patents for the subsequent organization of own production of building materials;

d) services of foreign construction companies in the production of construction works using new technologies;

To stimulate the conduct of exploratory and applied research, a single integrated information system should be created, containing all information about the innovation system, including ongoing research on industries and construction, as well as real estate management. It is advisable to carry out gradual integration into e-business and the complexity of automation, increasing the scale of IT penetration. As a consequence, the innovation market is transparent in terms of information about the main participants, organizational and legal conditions of work, directions of direct and indirect state support for innovation.

In modern conditions of high competition, the compliance of the internal environment of the enterprise with the growing requirements of the market is the most important factor of successful activity and causes the need for its constant transformation. In the conditions of an innovation-oriented market economy, enterprises face the problem of flexible rapid response to the instability of the market environment, on the one hand, and the formation of a long-term competitive policy and strategy for the development of enterprises[8].

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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THE MAIN TRENDS IN THE SPATIAL DEVELOPMENT OF TERRITORIES INCLUDED IN THE ARCTIC ZONE OF THE RUSSIAN FEDERATION. MESSAGE 1

Abstract: *in the article, the object of research is the State Program of the Russian Federation "The main trends in the spatial development of territories included in the Arctic zone of the Russian Federation" for the period up to 2035 as an expression of the policy of the Federal Center pursued in relation to the regions. The subject of the study are the elements of the above program, which, in conflict with regional specifics, hinder the achievement of the goals set in government documents. The analysis of the conducted research is the formation of an understanding of how the regions of the Arctic zone should be taken into account when formulating federal policy aimed at their socio-economic development. In order to achieve this goal, it is necessary to solve a number of tasks, namely:*

a) analyze the State Program, highlighting the main goals and methods for achieving the goals;

b) identify the specific features of the regions that impede the achievement of the goals set;

c) to propose specific ways to include the regional specifics of these regions in the model of the federal policy of the Arctic zone of the Russian Federation.

Key words: *priority, technical regulation, certification, standardization, financial condition, profitability, profit, demand, preferences, relevance, competitiveness, social and economic well-being of the regions of the Arctic zone.*

Language: *English*

Citation: Blagorodov, A. A., Rumyanskaya, N. S., Prokhorov, V. T., Tikhonova, N. V., & Volkova, G. Yu. (2023). The main trends in the spatial development of territories included in the Arctic zone of the Russian Federation. Message 1. *ISJ Theoretical & Applied Science, 03 (119)*, 258-272.

Soi: http://s-o-i.org/1.1/TAS-03-119-35 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.35

Scopus ASCC: *2000.*

Introduction

UDC 339.138

Assessment of the state of development of the Arctic zone and ensuring national security, the role of the Arctic zone in the socio-economic development of the Russian Federation and ensuring national security is determined by the following features (Figure 1):

Figure 1. Characteristics of the Arctic Zone of the Russian Federation.

a) The Arctic zone provides for the production of more than 80% of combustible natural gas and 17% of oil (including gas condensate) in the Russian Federation;

b) the largest economic projects implemented in the Arctic zone create demand and stimulate the production of high-tech and science-intensive products at hundreds of enterprises in other regions of the Russian Federation;

c) the continental shelf of the Russian Federation in the Arctic, according to experts, contains 85.1 trillion. cube m of combustible natural gas, 17.3 billion tons of oil (including gas condensate) and is the 3rd strategic reserve for the development of the mineral resource base of the Russian Federation;

d) as a result of climate change and the implementation of international policies to reduce greenhouse gas emissions, the role of the Northern Sea Route as a transport corridor of global importance for the transportation of national and international cargoes, consistent with the policy of sustainable development, will increase;

e) the possible onset of adverse environmental events in the Arctic zone as a result of anthropogenic impact and (or) climate change creates global risks for the economic system, environment and security of the Russian Federation and the world as a whole;

f) 19 small peoples live in the Arctic zone, their heritage objects are located, which are of historical and cultural value of global significance;

g) on the territory of the Arctic zone there are objects of strategic deterrence forces designed to prevent aggression against the Russian Federation and its allies.

The implementation of the Strategy for the Development of the Arctic Zone and Ensuring National Security for the period up to 2035 provided: an increase in life expectancy at birth in the Arctic zone from 70.65 years in 2018 to 72.39 years in 2022; decline between 2018-2022 migration outflow of the

population from the Arctic zone by 53%; decrease in the unemployment rate (according to the methodology of the International Labor Organization) from 5.6% in 2018 to 4.6% in 2022; an increase in the share of the gross regional product produced in the Arctic zone in the total gross regional product of the constituent entities of the Russian Federation from 5% in 2018 to 6.2% in 2022; an increase in the share of budgetary funds (budgets of all levels) in the total volume of investments in fixed capital in the Arctic zone from 5.5% in 2018 to 7.6% in 2022; growth in traffic along the Northern Sea Route from 4 million tons in 2018 to 31.5 million tons in 2022; an increase in the share of households in the Arctic zone that had broadband access to the Internet information and telecommunications network in the total number of households in the Arctic zone from 73.9% in 2018 to 81.3% in 2022; increase in the share of modern weapons, military and special equipment in the Arctic zone from 41% in 2018 to 59% in 2022.

Main part

The main problems, challenges and threats that form the risks of developing the Arctic zone and ensuring national security remain intensive climate warming in the Arctic, which is 2-2.5 times faster than on the planet as a whole; decrease in natural growth, migration outflow and, as a result, a decrease in the population of the Arctic zone; lagging behind the values of indicators characterizing the quality of life in the Arctic zone from the all-Russian or average values for the constituent entities of the Russian Federation, including life expectancy at birth, mortality of the able-bodied population, infant mortality, the share of public roads that meet regulatory requirements, the share of emergency housing fund, the volume of commissioning of housing, the share of the area of the housing stock, provided with all kinds of amenities; low level of availability of high-quality social services and comfortable housing in settlements located in remote areas, including in places of traditional residence and traditional economic activities of small peoples; a high level of occupational risk, characterized by a complex effect of harmful production and cooling meteorological factors of working conditions, and an increased level of occupational morbidity compared to other regions of the country; the absence of a system of state support for the delivery of fuel, food and other vital goods to the Arctic zone, which ensures their sale to citizens and business entities at affordable prices; low level of development and high cost of creating transport infrastructure, including those necessary for the development of small aviation and the provision of year-round air transportation at affordable prices; non-competitiveness of business entities as a result of higher costs of economic activity, including as a result of the provision of guarantees and compensations to persons working in the Far North and equivalent areas.

Regrettably, the slow rates of geological exploration of promising mineral resource centers remain, including those on the continental shelf of the Russian Federation in the Arctic; inconsistency of the system of secondary vocational and higher education in the Arctic zone with the needs of the economy and the social sphere in qualified personnel; the delay in the development of the infrastructure of the Northern Sea Route, the construction of icebreaking, rescue and auxiliary fleet vessels from the timing of the implementation of economic projects in the Arctic zone; the lack of an emergency evacuation system and the provision of medical assistance to crew members of ships in the waters of the Northern Sea Route; low level of development of information and communication infrastructure and competition in the field of telecommunications; a high proportion of local electricity generation based on economically and environmentally inefficient diesel fuel; reduction in the share of value added of high-tech and knowledge-intensive sectors of the economy in the gross regional product of the Arctic zone of the Russian Federation, low rates of development of domestic technologies necessary for the development of the Arctic; low rates of fundamental and applied research, development of domestic technologies necessary for the development of the Arctic zone; the unpreparedness of the environmental monitoring system located in the Arctic zone for environmental challenges; low level of investment in fixed capital, carried out for the protection and rational use of natural resources; the danger associated with the cross-border transfer of especially dangerous infections and highly toxic chemicals; discrepancy between the level of development of the emergency rescue infrastructure and the public safety system and the growth rate of economic activity in the Arctic zone; the growing conflict potential in the Arctic, which requires a constant increase in the combat capabilities of groupings of general-purpose troops (forces) of the Armed Forces of the Russian Federation, other troops, military formations and bodies in the Arctic zone.

In 2021, the public administration system was brought into line with the challenges in the development of the Arctic zone and ensuring national security; a new composition was formed and the powers of the State Commission for the Development of the Arctic were expanded, the Ministry of the Russian Federation for the Development of the Far East and the Arctic was formed, a decision was made to expand the competence of the institutions for the development of the Far East to the Arctic zone.

Improvement of legal regulation in order to adopt separate standards for the provision of medical care for certain diseases to citizens living in the regions of the Far North, as well as establishing for medical organizations (branches or divisions of medical organizations) in the regions of the Far North and equivalent areas of personal staffing standards for

medical workers and equipment standards based on morbidity statistics and medical evacuations; organization of medical support for navigation of vessels in the waters of the Northern Sea Route, the operation of stationary and floating offshore platforms in the waters of the Arctic Ocean; development of high-tech medical care in the regions of the Arctic zone of the Russian Federation; h) improving measures for the prevention of diseases, including infectious ones, and implementation of a set of measures aimed at building a commitment to a healthy lifestyle, including motivating citizens to switch to a healthy diet and reduce alcohol and tobacco consumption; providing social support for medical workers in order to eliminate the shortage of personnel; development of optimal placement schemes and modernization of healthcare facilities (not related to primary health care), education, culture, physical culture and sports, ensuring their accessibility for the population, taking into account demographic forecasts, forecasts for staffing the economy, transport remoteness of settlements and the peculiarities of the settlement of small peoples ; development of distance educational technologies; improving the legal regulation of the provision of educational services to representatives of small peoples; creation and development of specialized educational and scientific centers for talented children and regional centers for identifying, supporting and developing abilities and talents in children and youth; development, together with large and medium-sized enterprises, of a network of professional educational organizations, including the creation of advanced professional training centers and equipping workshops with modern material and technical base in accordance with WorldSkills standards.

Advanced development of educational organizations of higher education, their integration with scientific organizations; establishing the specifics of the requirements of the legislation in the field of ensuring the sanitary and epidemiological well-being of a person for the Arctic zone; implementation of a set of measures to eliminate the harmful effects of environmental factors and prevent adverse effects on public health associated with climate change in the Arctic zone, including assessment of the impact on the sources and ways of spread of climate-dependent infectious and parasitic diseases; implementation of a set of measures to research, preserve and popularize cultural heritage, develop traditional culture, preserve and develop the languages of small peoples; state support for travel and visits to cultural institutions for children, living in remote settlements, tours and traveling exhibitions of creative teams and cultural institutions, participation of local sports teams in interregional and all-Russian sports competitions, holding all-Russian festivals and creative projects, major sporting events in the Arctic zone; creating conditions for increasing the proportion of citizens systematically engaged in physical culture and sports, and increasing the level of provision of citizens with sports facilities based on the one-time throughput of sports facilities; improvement of mechanisms for subsidizing mainline, interregional and local (within regional) air transportation; formation of a modern urban environment in settlements, including through the improvement of public and courtyard spaces, taking into account the natural and climatic features of the Arctic and the introduction of advanced digital and engineering solutions; state support for housing construction, including wooden housing construction, as well as the construction of engineering and social infrastructure in settlements that perform the functions of ensuring national security and (or) the functions of a base for the development of mineral resource centers, the implementation of economic and (or) infrastructure projects in the Arctic, as well as in places of traditional residence of small peoples; stimulating the participation of state corporations, companies with state participation and private investors in the creation and modernization of 9 social, housing, communal and transport infrastructure, as well as in the development of indigenous peoples, places of their traditional residence and traditional economic activity; w) creation of a system of preferences for citizens of the Russian Federation working and living in the Arctic zone; creation of a unified system of state support for the delivery of fuel, food and other vital goods to remote settlements.

The main tasks in the field of economic development of the Arctic zone are achieved through the following set of measures, namely: through the development of a special economic regime in the Arctic zone of the Russian Federation, which stimulates the transition to a circular economy, the implementation of private investment in geological exploration, the creation of new and modernization of existing industrial industries, the development of science-intensive and high-tech industries, the development of new oil and gas provinces, deposits of solid minerals and hard-to-recover hydrocarbon reserves, deep oil refining, the production of liquefied natural gas and gas chemical products; state support for capital investments in transport, energy and engineering infrastructure, including the infrastructure of gas supply systems, water supply, pipeline transport and communications necessary for the implementation of new investment projects selected or determined in accordance with the procedures or criteria established by federal laws and other regulatory legal acts; development and implementation of a program of state support for the traditional economic activities of small peoples living in the Arctic zone; simplification of the procedure for granting land plots to citizens for the purpose of carrying out economic and other activities not prohibited by law; development of digital services for

the provision of forest and fish-breeding areas for use; development and implementation of a program for the geological study of the Arctic zone of the Russian Federation;

Creation and development of a new model for the implementation of economic projects on the continental shelf of the Russian Federation in the Arctic, providing for the expansion of the participation of private investors in such projects while maintaining state control over their implementation; state support for the creation and development of technologies and industrial products for the development of oil and gas fields, including those on the continental shelf of the Russian Federation, the production of liquefied natural gas; stimulating the predominant use of Russian-made industrial products in the implementation of new economic projects; state support for the creation and (or) modernization of fish processing complexes, aquaculture enterprises, greenhouse farms and livestock complexes; development and implementation of legal and organizational measures to prevent illegal extraction and sale of marine biological resources, as well as to stimulate the sale of harvested marine biological resources; development of a mechanism for state support for the intensification of reforestation, the development of forest infrastructure and deep processing of forest resources, the development of a system of aviation protection of forests from fires; state support for the construction of Arctic ice-class cruise ships on the territory of the Russian Federation and the development of tourism infrastructure. development of a system of aviation protection of forests from fires; state support for the construction of Arctic ice-class cruise ships on the territory of the Russian Federation and the development of tourism infrastructure. development of a system of aviation protection of forests from fires; state support for the construction of Arctic ice-class cruise ships on the territory of the Russian Federation and the development of tourism infrastructure.

The main tasks in the development of the infrastructure of the Arctic zone are achieved through the following set of measures, namely: due to the integrated development of the infrastructure of the transport corridor, which includes ports and sea shipping routes of the Barents, White and Pechora Seas on the western flank, the waters of the Northern Sea Route, the Bering Sea on the eastern flank (hereinafter referred to as the Northern Sea Transport Corridor); creation of a headquarters for maritime operations to manage navigation throughout the entire water area of the northern sea transport corridor; integration of the provision of transport and logistics services for transportation along the northern sea transport corridor based on a digital platform for paperless processing of multimodal transportation of passengers and goods; construction of at least 5 universal nuclear icebreakers of project 22220, 3 nuclear icebreakers of the Leader project, 16 rescue and 11 towing and rescue vessels of various capacities, 3 hydrographic and 2 pilot vessels; organization of training and retraining of personnel, taking into account the need for the development of transportation in the waters of the northern sea transport corridor; development and approval of a program for the construction of a merchant cargo fleet for the needs of economic projects and cargo-passenger ships for transportation between sea and river ports in the Arctic zone; construction of ports - hubs and the creation of a Russian container operator that ensures the implementation of international and cabotage transportation along the northern sea transport corridor; expanding the possibilities of navigation along the Belomoro - Baltic Canal, the basins of the Onega, Northern Dvina, Mezen, Pechora, Ob, Yenisei, Lena rivers. Kolyma and other rivers on the territory of the Arctic zone of the Russian Federation, including dredging, development of ports and port points; adoption of a set of measures to develop the use of liquefied natural gas in sea and river transport in the water area of the northern sea transport corridor and energy supply to settlements; development of a scheme for the development of airport complexes and checkpoints across the state border of the Russian Federation in conjunction with the development of the northern sea transport corridor and the implementation of economic projects; development and implementation of engineering and technical solutions that ensure the sustainable functioning of infrastructure in the face of climate change; construction and reconstruction of local roads, including those in remote settlements; deploying a highly elliptical space system providing high temporal resolution hydro meteorological data for the Earth's polar region; creation and development of a satellite constellation in highly elliptical orbits, providing satellite communications for users in the waters of the northern sea transport corridor and in territories north of 70 degrees north latitude, as well as the required quality and speed of the automatic identification system and Earth remote sensing systems based on domestic equipment.

Construction of a trans-Arctic main submarine fiber-optic communication line with access to local communication lines to the largest ports of the northern sea transport corridor and settlements in the Arctic zone; ensuring the radiation safety of seaports when surface ships and ships with nuclear power plants, nuclear service ships and floating power units of nuclear thermal power plants enter and stay in them; development and implementation of a new mechanism for state support of projects to improve the efficiency of generation in isolated and hard-to-reach areas using solutions based on liquefied natural gas, renewable energy sources and local fuel;

development of an international research program (including expeditionary ones) on the state of

the Arctic ecosystems, global climate change and the study of the Arctic; formation of a register of critical technologies in the interests of the development and sustainable development of the Arctic, the creation of a mechanism for coordinating their development and financing; construction of a drifting ice-resistant self-propelled platform and research vessels for the purpose of research and study of the Arctic.

Carrying out hydrographic surveys to ensure the safety of navigation, as well as long-term hydrographic surveys, including deep-sea ones, to study the underwater environment; ensuring the creation of new functional and structural materials necessary for the implementation of economic activities in the Arctic; creation of a system of scientific and educational centers in key areas of fundamental and applied research in the interests of the development of the Arctic; development of a system for monitoring, evaluating and forecasting the development of science and technology in the Arctic zone.

The main tasks in the field of environmental protection and ensuring environmental safety are achieved through the following set of measures, namely: development and implementation of a set of measures to adapt the socio-economic and ecological systems of the Arctic zone to climate change; development and implementation of a set of measures to eliminate the accumulated harm to the environment, including the rehabilitation of territories from flooded and sunken objects with spent nuclear fuel and radioactive waste; development and implementation of a set of measures to develop an environmental monitoring system using modern information and telecommunication technologies and communication systems; increasing the density of the network of Roshydromet stations and their technical equipment to the values recommended by the World Meteorological Organization; state support for the introduction of the best available technologies for the neutralization and purification of territories contaminated with hazardous waste, in the implementation of economic and other activities in the Arctic zone; ensuring the adoption of preventive measures that exclude negative environmental consequences during the development of natural resources, including the development of a system for monitoring and responding to oil and oil product spills; developing a system for monitoring, assessing and forecasting the risks of transboundary transfer of hazardous pollutants and infections, including by biological means. excluding negative environmental consequences in the course of work on the development of natural resources, including the development of a system for monitoring and responding to oil and oil product spills; developing a system for monitoring, assessing and forecasting the risks of transboundary transfer of hazardous pollutants and infections, including by biological means. excluding negative environmental consequences in the course of work on the development of natural resources, including the development of a system for monitoring and responding to oil and oil product spills; developing a system for monitoring, assessing and forecasting the risks of transboundary transfer of hazardous pollutants and infections, including by biological means.

Carrying out a regular assessment of the environmental and socio-economic consequences of anthropogenic impact on the environment of the Arctic zone, including those resulting from the transboundary transfer of pollutants from the countries of North America, Europe and Asia; organizing a regular assessment of the impact of nuclear shipbuilding and ship repair enterprises located in the Arctic zone on the environment and the population; ensuring the rational use of associated petroleum gas in order to minimize its flaring, including through the development and implementation of modern technologies in the implementation of new economic projects; state support for the construction of environmentally friendly waste processing complexes, improvement of legal regulation of activities in the field of waste management in the Arctic zone; creation of a system for promptly informing public authorities and the population about the occurrence or increase in the risks of harmful effects of the most dangerous pollutants and pathogens of infectious diseases in connection with extreme natural phenomena caused by climate change; improvement of the national system for assessing, monitoring and ensuring the safe handling of hazardous waste and the prevention of consequences in areas of the Arctic zone with prevailing low and extremely low temperatures.

The main tasks in the development of international cooperation are achieved through the following set of measures, namely: the implementation of multi-vector foreign policy activities to preserve the Arctic as a territory of peace, stability, mutually beneficial cooperation; ensuring mutually beneficial bilateral and multilateral cooperation between the Russian Federation and foreign states, including on the basis of international treaties, agreements and conventions to which the Russian Federation is a party; completion of the international legal formalization of the outer border of the continental shelf of the Russian Federation in the Arctic Ocean; ensuring an effective Russian presence in the Svalbard archipelago in conditions of equal and mutually beneficial cooperation with Norway and other countries participating in the Spitsbergen Treaty of 1920; assistance in building up the efforts of the Arctic states in creating a unified regional system of search and rescue, as well as the prevention of man-made disasters and the elimination of their consequences, including the coordination of the activities of rescue forces, the consolidation of interaction between the Arctic states within the

framework of the Arctic Coast Guard Forum; development and implementation of programs for economic and humanitarian cooperation between the territories that are part of the Arctic zone and the regions of the Arctic states; active participation of Russian state institutions and public organizations in the work of the Arctic Council and other international forums, dedicated to the Arctic issues; h) ensuring the effective chairmanship of the Russian Federation in the Arctic Council in 2021-2023, including the promotion of joint projects, including those aimed at ensuring the sustainable development of the Arctic and preserving the cultural heritage of indigenous peoples; promoting the strengthening of ties between indigenous peoples living in the Arctic zone and indigenous peoples living in the Arctic territories of foreign states, including holding relevant international forums on this topic; promoting the comprehensive development of the young generation of indigenous peoples through educational, humanitarian and cultural exchanges with the youth of other Arctic states; development and publication of general principles for the implementation of investment projects with the participation of foreign capital in the Arctic zone; organization of relevant events in order to attract foreign investors to economic projects in the Arctic zone; contributing to the strengthening of the Arctic Economic Council as one of the central forums in the field of sustainable development of the Arctic; development and implementation by Russian organizations in cooperation with foreign partners of basic and additional professional educational programs in the field of development and exploration of the Arctic; ensuring the implementation of the Agreement on Strengthening International Arctic Scientific Cooperation. contributing to the strengthening of the Arctic Economic Council as one of the central forums in the field of sustainable development of the Arctic; development and implementation by Russian organizations in cooperation with foreign partners of basic and additional professional educational programs in the field of development and exploration of the Arctic; ensuring the implementation of the Agreement on Strengthening International Arctic Scientific Cooperation. contributing to the strengthening of the Arctic Economic Council as one of the central forums in the field of sustainable development of the Arctic; development and implementation by Russian organizations in cooperation with foreign partners of basic and additional professional educational programs in the field of development and exploration of the Arctic; ensuring the implementation of the Agreement on Strengthening International Arctic Scientific Cooperation.

The main tasks in the field of ensuring the protection of the population and territories of the Arctic zone from natural and man-made emergencies are achieved through the following set of measures, namely: by identifying and studying the risks of natural and man-made emergencies, and ways to prevent them; development of technical means, technologies and equipment for emergency rescue operations and fire extinguishing, development of the aviation fleet, aviation infrastructure and aviation rescue technologies in order to ensure the protection of the population and territories, reduce the response time to emergency situations, taking into account the tasks to be solved and natural and climatic conditions of the Arctic zone; improving the ways of protecting the population and territories, extinguishing fires and temporary accommodation in the Arctic conditions of the population and professional contingent during the elimination of natural and man-made emergencies; improving ways to increase the level of protection of critical and potentially dangerous facilities, ensuring the sustainability of their operation in emergency situations in the Arctic; improving the regulatory legal and regulatory framework in the field of protecting the population and territories, critically important and potentially hazardous facilities from natural and man-made emergencies, in the field of fire safety, taking into account the specifics of facilities planned for construction in the Arctic zone; development of systems for monitoring and forecasting emergency situations in the Arctic zone, including on the basis of receiving and processing space information; development of an anti-crisis management system within the framework of a unified state system for the prevention and elimination of emergency situations; development of the technical and tactical capabilities of the Arctic integrated emergency rescue centers in preventing and responding to emergencies by improving their structure and composition, basing infrastructure and modern logistics, taking into account the tasks being solved and the natural and climatic conditions of the Arctic zone.

Organization and participation in exercises, trainings to test the readiness of forces and means in the Arctic states to eliminate natural and man-made emergencies, including during the implementation of major economic and infrastructure projects; development and establishment of requirements for emergency equipment and means of providing assistance to save life and health in the event of radiation accidents and incidents in the Arctic zone.

The main tasks in the field of ensuring public security in the Arctic zone are achieved through the following set of measures, namely: by improving the structure and staffing of the internal affairs bodies of the Russian Federation and the troops of the National Guard of the Russian Federation; equipping the internal affairs bodies of the Russian Federation and the troops of the National Guard of the Russian Federation stationed in the Arctic zone with modern weapons, vehicles, communications, special and military equipment adapted to the Arctic conditions; implementation of a set of measures aimed at

preventing extremist activity and terrorism; improving the effectiveness of the prevention of neglect, social assistance and rehabilitation of minors with various forms and degrees of decontamination; creating conditions for the development of people's squads and other law enforcement associations, the anti-drug movement, public anti-drug associations and organizations, the creation of regional segments of the national system for the comprehensive rehabilitation of resocialization of people who use drugs; prevention of crimes at the enterprises of the fuel and energy complex, housing and communal services, as well as those committed using information and telecommunication technologies; implementation, development and maintenance of the systems of the law enforcement segment of the hardware and software complex "Safe City".

The main tasks in the field of ensuring military security, protection and protection of the state border of the Russian Federation in the Arctic are achieved through the following set of measures, namely: by improving the composition and structure of military units and subunits of the Armed Forces of the Russian Federation, other troops, military formations and bodies in the Arctic zone; ensuring a favorable operational regime in the Arctic zone, including maintaining the level of combat readiness of groupings of general-purpose troops (forces) of the Armed Forces of the Russian Federation, other troops, military formations and bodies in accordance with the existing and predicted nature of military dangers and military threats to the Russian Federation in the Arctic; equipping the Armed Forces of the Russian Federation, other troops, military formations and bodies, stationed in the Arctic zone, with modern weapons, military and special equipment adapted to the Arctic conditions; development of the basing infrastructure, operational equipment of the territory and the logistics system of the Armed Forces of the Russian Federation, other troops, military formations and bodies intended to perform tasks in the Arctic zone; the use of dual-use technologies and infrastructure facilities in the interests of a comprehensive solution of defense tasks in the Arctic zone. designed to perform tasks in the Arctic zone; the use of dual-use technologies and infrastructure facilities in the interests of a comprehensive solution of defense tasks in the Arctic zone. designed to perform tasks in the Arctic zone; the use of dual-use technologies and infrastructure facilities in the interests of a comprehensive solution of defense tasks in the Arctic zone.

The main directions of development of the territories that are part of the Arctic zone or ensure its study and development will be considered in the second message for the following regions of the Russian Arctic:

features of the main directions of development of the regions of the Murmansk region;

features of the main directions of development of the regions of the Nenets Autonomous Okrug;

features of the main directions of development of the regions of the Yamalo-Nenets Autonomous Okrug;

features of the main directions of development of municipalities of the Republic of Karelia;

features of the main directions of development of the municipalities of the Republic of Komi, which are part of the Arctic zone;

features of the main directions of development of the municipalities of the Republic of Sakha (Yakutia), which are part of the Arctic zone;

features of the main directions of development of the municipalities of the Krasnoyarsk Territory, which are part of the Arctic zone;

features of the main directions of development of the municipalities of the Arkhangelsk region, which are part of the Arctic zone;

features of the main directions of development of St. Petersburg as a historical center for the study and development of the Arctic zone of the Russian Federation.

The implementation of this Strategy is carried out in three stages:

the first stage (2021-2025);

second stage (2026-2030);

third stage (2031-2035).

At the first stage (2021-2025) of the implementation of this Strategy, there will be:

a) mechanisms have been formed to accelerate the economic and social development of the Arctic territories, including the creation of a legal framework for the functioning of a special economic regime in the Arctic zone;

b) modernization of primary health care was carried out, including equipping medical organizations providing primary health care with road and air transport, including for the purposes of medical evacuation from ships in the waters of the northern sea transport corridor;

c) a system of preferences has been launched for citizens of the Russian Federation working and living in the Arctic zone;

d) a program of state support for the traditional economic activities of small peoples living in the Arctic zone was approved;

e) the system of vocational education in the Arctic zone has been brought into line with the prospective staffing needs, including the equipping of educational organizations with modern material and technical base;

f) a world-class scientific and educational center in the field of Arctic research and development has been created;

g) pilot projects have been implemented for the integrated development of settlements that perform the functions of ensuring national security and (or) bases for the development of mineral resource centers,

the implementation of economic and (or) infrastructure projects in the Arctic, and the improvement of the organization of the delivery of fuel to remote settlements, food and other vital goods; h) a mechanism was put in place to subsidize local (within regional) transportation in the Arctic zone;

i) a new model for the implementation of economic projects on the continental shelf of the Russian Federation in the Arctic has been launched;

j) the development of the western part of the Northern Sea Route was accelerated, 3 universal nuclear icebreakers of project 22220, 16 rescue and tugboat rescue vessels of various capacities, 3 hydrographic and 2 pilot vessels were built;

k) the implementation of measures to replace inefficient diesel generation in isolated and hard-to-reach areas with generation based on liquefied natural gas, renewable energy sources, and local fuel has begun;

l) the possibility of providing access to the Internet information and communication network for households in settlements with a population of 100 to 500 people is provided; m) a satellite constellation has been created in highly elliptical orbits, which ensures stable uninterrupted satellite communications in the Arctic zone;

n) launched a comprehensive program of fundamental and applied research in the interests of the development of the Arctic;

o) a state system for monitoring and preventing the negative consequences of permafrost degradation has been established;

p) the intensification of international economic, scientific and humanitarian cooperation in the Arctic zone is ensured;

c) the system of baselines for counting the width of the territorial sea and the exclusive economic zone of the Russian Federation in the Arctic Ocean has been updated, and proposals have been substantiated on the advisability of declaring additional areas of the Arctic seas the historical waters of the Russian Federation.

At the second stage (2026 - 2030) of the implementation of this Strategy, there will be:

a) work continued to improve the competitiveness of the special economic regime of the Arctic zone, taking into account the needs of investors, the changing external and internal conditions of economic activity in the Arctic;

b) accessibility of the network of institutions of education, culture, physical culture and sports for the population of the Arctic zone, including small peoples;

c) the formation of a competitive system of professional educational organizations, advanced professional training centers and educational organizations of higher education has been completed;

d) a scaled-up program for the integrated development of settlements that perform the functions of ensuring national security and (or) bases for the development of mineral resource centers, the implementation of economic and (or) infrastructure projects in the Arctic;

e) year-round shipping is provided throughout the entire water area of the Northern Sea Route, 2 additional universal nuclear icebreakers of project 22220 and 1 icebreaker of the Leader project are built, construction of hub ports for transshipment of international container cargo has begun;

f) the implementation of a program for the development of river navigation in the river basins in the Arctic zone has begun;

g) a program for the development of the tourism infrastructure of the Arctic zone has been implemented

h) a trans-Arctic main submarine fiber-optic communication line was built;

i) a highly elliptical space system has been created to provide high-resolution hydrometeorological data on the polar region of the Earth;

j) put into commercial operation modern samples of new materials and equipment, including robotic and shipbuilding, unmanned transport systems, portable energy sources in order to intensify the development of the Arctic;

k) completed the rehabilitation of the Arctic zone from flooded and sunken objects with spent nuclear fuel and radioactive waste;

l) work continued to improve the efficiency of the Unified State System for the Prevention and Elimination of Emergencies in the Arctic Zone.

At the third stage (2031 - 2035) of the implementation of this Strategy will be:

a) a progressive increase in capacities for the production of liquefied natural gas, gas chemical products, oil production on the continental shelf of the Russian Federation in the Arctic and the onshore part of the Arctic zone, and deep processing of other minerals and natural resources;

b) the urban environment and social infrastructure of settlements that perform the functions of ensuring national security and (or) the base for the development of mineral resource centers, the implementation of economic and (or) infrastructure projects in the Arctic, is brought into line with the needs of their population; c) ensuring the availability of high-quality social services to representatives of small peoples living in the Arctic zone, and the intensive development of their traditional economic activities;

d) a competitive international and national transport corridor was formed on the basis of the Northern Sea Route, hub ports were built for transshipment of international container cargo and an additional 2 icebreakers of the Leader project;

e) the replacement of inefficient diesel generation in isolated and hard-to-reach areas with generation based on liquefied natural gas, renewable

energy sources, and local fuel has been completed;

f) the implementation of the program for the development of river navigation in the river basins in the Arctic zone has been completed;

g) ensured the reduction and prevention of the negative impact of economic activities on the environment of the Arctic zone.

The target indicators for the implementation of this Strategy are indicators that characterize the effectiveness of the implementation of the state policy of the Russian Federation in the Arctic, provided for by the Fundamentals. The values of target indicators based on the results of each stage of the implementation of this Strategy are given in the Appendix.

The main mechanisms for the implementation and resource support of the activities provided for by this Strategy.

The Government of the Russian Federation develops and approves a unified plan for the implementation of the Fundamentals and the Strategy for each stage provided for in paragraph 30 of this Strategy.

The implementation of this Strategy is ensured by amending the state program of the Russian Federation "Socio-economic development of the Arctic zone of the Russian Federation", sectoral state programs of the Russian Federation, state programs of the constituent entities of the Russian Federation, national projects, as well as the implementation of activities of the Northern Sea Route infrastructure development plan.

The solution of tasks in the field of military security, protection and protection of the state border of the Russian Federation is ensured by the implementation of measures of the state armaments program within the framework of the state defense order, state programs of the Russian Federation.

General management of the implementation of this Strategy is carried out by the President of the Russian Federation.

The coordination of the activities of federal executive authorities, state authorities of the constituent entities of the Russian Federation and local authorities on the implementation of this Strategy, as well as monitoring its implementation, is carried out by the State Commission for the Development of the Arctic.

The tasks, functions and procedure for interaction between state authorities and local governments in order to implement state policy in the Arctic are determined in accordance with the legislation of the Russian Federation.

The implementation of this Strategy is carried out at the expense of the budgets of the budgetary system of the Russian Federation, including at the expense of funds provided for the implementation of the state program of the Russian Federation "Socio-economic development of the Arctic zone of the Russian Federation", and extra-budgetary sources.

To some extent, the wandering of scientific searches in the labyrinth of dialectical thinking is also connected with the fact that philosophers who do not understand the scale of the significance of the study of transport for the spatial development of the territories that are part of the Arctic zone of the Russian Federation are weakly included in the process. "Transport" is a concept ideological scale. Moreover, “transport” is a system-forming concept in the worldview, since it is transport that serves as the most important factor in the implementation of the movement of matter. It is only possible to understand the very scale of the ideological status of transport in different ways: to consider transport exclusively material in nature, limiting it to the sphere of matter itself, selectively evaluating the presence of transport in properties, for example, the possibility of the presence of transport in the movement of thinking, or only in cognition, taking into account , that reflection is subject dependent. The movement of knowledge, as a process of production of the beginning of the movement of knowledge as self-movement, is undoubtedly due to transport. We connect the substantiation of this conclusion with the development of the concept of "movement" within its dialectical-materialistic interpretation, confirmed by numerous discoveries and misconceptions of modern natural science, as well as the practice of human life in all its forms. “Movement” is the next most important concept after “substance” in the construction of a worldview. "Substance" determines the nature of "being", "movement" shows the mode of existence of "being". F. Engels in his "Dialectics of Nature", characterizing the movement, noted: "Movement, considered in the most general sense of the word, i.e. understood as a way of existence of matter, as an inherent attribute of matter, embraces all the changes and processes taking place in the universe, starting from simple movement and ending with thinking. In the preparatory works for Anti-Dühring, F. Engels specifies the characteristics of motion: “Motion is a way of existence of matter, therefore, something more than just its property. Matter does not exist and never could exist without motion.

From the direct definition of motion by F. Engels, two of its qualitative features are clear: the function of motion is to be a way of existence of matter, and the main feature characterizing motion is to produce changes. Change is the main manifestation of movement. Our task is to complete the description of the movement, taking into account its special position in the worldview, that is, to reveal its systemic worldview status. For clarity of presentation, we offer the following scheme (Figure 1). All systemic elements of movement, with the exception of the position of transport, have been studied to some extent in the literature, which serves as the basis for us to focus on transport. Based on the historically

established understanding of transport as a tool for the carriage of goods in a fairly broad understanding of their subject structure, we, following the logic of the formation of concepts, disclosed by G. Hegel, they tried to give the definition of the concept of "transport" universality. Do not limit the substantive idea of the cargo in general, keeping in mind that the carrier itself can be considered as cargo - in a particular case. Freedom in determining what should be included in the scope of the concept of "cargo" opened up the prospect of understanding transport from the very beginning of the history of the universe, to give transport the property of universality. Moreover, in the system of signs characterizing the movement there was an unoccupied position of the "instrument" for the implementation of the movement. As a result, transport received its rightful place in the content system of the concept of "spatial movement", having naturally become a truly universal phenomenon in the world.

Figure 2. System representation of the content "spatial movement" for the concept of "transport".

The position in the system is determined by the specifics of the phenomenon and is associated with certain functions assigned to it. Transport is not limited by its basic purpose - to be an instrument of movement in space and time. Its position is multifunctional:

• with the help of transport, the spatio-temporal reality of phenomena is ensured, the existence of which requires the certainty of the spatial position within the time conditioned by reality, that is, transport is not just a driving tool, its function is to contribute to the reproduction of the spatio-temporal status of a systemic formation;

• transport is involved in achieving the required interactions between objects or states of objects and the conditions of their development (movement);

• transport is included in the order of functioning of the phenomenon, as a component of its self-propulsion

• the functioning of transport is one of the factors protecting the qualitative identity of phenomena.

On the example of various types of transport, British specialists have shown the functional diversity of biological transport as the most important condition for the reproduction of a living cell, a factor in its normal existence, including mitosis. It is advisable to build a classification of transport taking into account the universality of movement and its qualitative diversity, represented by the forms of movement of matter. The following types are distinguished in the basic classification:

• physical,
• mechanical,
• chemical,
• biological,
• social.

It is expedient to put "informational" apart. In our understanding, the history of social transport is

divided into 3 stages:

Stage 1: ensuring the evolutionary viability of the type (competitiveness) of the way of moving the means of transportation the instrument of fixing (means of construction) of places of residence;

Stage 2: ensuring the development of the community (the formation and development of a national organization) in national forms: a communication tool a means of competition a way to ensure community management a factor in the formation of intersubjective formations and the formation of a national form of community a tool for creating empires;

Stage 3: ensuring social progress in the context of modernization associated with the Industrial Revolution (modern) the emergence and development of mass technical transport, the development of technically produced energy, the diversification of technical transport, the activation of the cognitive and cultural functions of transport.

In more detail, the history of social transport can be qualified as follows:

• undifferentiated transport, when the vehicle was the person himself;

• mechanical natural stage;

• stage of connection of technical transport with technically received energy;

• cosmic near, limited by the solar system;

• cosmic distant - trans systemic, galactic The inclusion of transport in the systemic understanding of movement should not be qualified as a desire to revise the traditional interpretation of transport. In the traditional understanding, as well as unusual for a widespread interpretation, found among British specialists, transport is defined at the level of representation, reduced to its particular manifestations in the social form of movement. The lack of universal understanding hinders the scientific approach to cognition. This, in our opinion, is also connected with the uncertainty of the status of transport science, which allows the recognition of the reality of transport science and its conditional reality - phantomness. Transport science is born in the bowels of the next, post-non-classical stage in the development of science. To make her self-determined and without this, its status will remain as before a "scientific secret", general scientific support and complicity of philosophical reflection are needed. The birth of transport science does not rest on particular subject certainty, it requires more thorough and innovative methodological support. K. Popper "felt" the right direction of scientific progress back in the 1950s - 70s. “The progress of science,” wrote the German philosopher, is due not to the fact that more and more perceptual experience accumulates over time, and not to the fact that we are making better use of our senses. Science cannot be obtained from uninterpreted sensory perceptions, no matter how carefully we collect them. Bold ideas, unjustified anticipations and speculative thinking are our only means of interpreting nature, our only organ, our only instrument of understanding it. And we must take risks in order to win. Those of us who are afraid of risking refutation of our ideas are not playing the science game.” At the end of his reflections on the driving mechanisms of scientific progress, a well-known specialist in the philosophy and logic of science ventured to reveal the secret of scholarship itself: “It is not the possession of knowledge, irrefutable truth that makes a person a scientist, but his constant and courageous critical striving for truth.”

Conclusion

It is not necessary to hope for a “miraculous transformation” in the understanding of transport and transport science. The current view of transport is rooted in the practice of economic policy, the architecture of economic planning has been laid out for it, in which transport is assigned a “working” place - to be in the “service” of production, but not the locomotive of its promotion. The history of the rise of Rome, Holland, Spain, Portugal, Britain, a little later than Germany, and the historical experience of the Russian State do not teach politicians. Even the birth of space transport has changed little in the political understanding of transport, and as long as political reflection is not built on the basis of general scientific thinking, scientific and philosophical ideas will remain wishes, but not imperatives.

The integration of economic science is realized unilaterally, it loses its specific methodological base, borrowing mathematical methods of analysis. They are, of course, spatially fruitful and no one doubts their effectiveness, however, the movement of economic science, in addition to the “quantitative” coast, also has a political coast, on which qualitative landmarks of spatial movement, regulated by the world outlook, are built. Not transport should be subordinated to the development of the economy, but the economy should be developed on the basis of the modern understanding of transport as a system-forming factor in the spatial development of the movement of the world in general and social progress in particular. The history of man as a biological species and social form of human reality testifies to the fact that that evolution was carried out thanks to the development of human living space, moving first in the physical space, and, as the formation of their own social space, and in it. Civilization is the product of this process. In the new millennium, the significance of space for the improvement of human life is even more relevant, therefore, no matter how high the value of social space is, it is necessary to go beyond this form and consider the problem of spatial development of the world with the help of transport, understood in a broad ideological context, as a priority in politics. And the most practical policy to develop not as a systemic reaction to the action of forces from the existing reality of the world,

As a result, we have to formulate recommendations for the federal Center on what previously unaccounted for factors and how exactly should be taken into account when developing and implementing state policy in relation to the regions of the Arctic zone of the Russian Federation, namely:

First of all, it seems important to us to conduct a high-quality and professional examination at the initial stage of formulating the state. policy in relation to the regions of the Russian Arctic. At the same time, it is important that not only representatives of the Moscow expert community take part in the examination, but also experts located directly in the regions who know the local specifics;

secondly, the national strategy for the development of specific regions, which are, in fact, all regions of the Russian Arctic, should be based on the fullest possible set of characteristics of the region, including economic, social, political and, no less important, cultural specifics . As we have already seen in the course of the analysis, ignoring any of these factors can lead, at best, to the absence of positive changes, and at worst, to the appearance of negative consequences that will be difficult to deal with. It is characteristic that in national strategies there is such an obligatory part as a description of the problematic situation, the most “acute” moments, but there is no description of regional specifics. It seems expedient to develop a kind of matrix,

thirdly, it seems to us that the reform of law enforcement agencies is inevitable in the regions of the Russian Arctic: when more than 90% of the population of the region do not trust law enforcement agencies, this is a clear and tangible signal to the authorities for active reforms.

Further ignoring this problem and removing it from public political discourse will only lead to negative consequences, possibly an increase in violence in these districts. We see the main directions of changes in the law enforcement sphere as follows: it is extremely important to increase the general level of erudition and broaden the horizons of law enforcement officers, they must be familiar with the cultural characteristics of the region through the introduction of compulsory courses on the culture of the North Caucasian republics taught by civil sociologists and culturologists. It also seems important to us to increase the percentage of “locals” among law enforcement officers. This measure will reduce tension between the local population and the security forces, who will no longer be perceived solely as "external invaders" and enemies, besides, the problem of ignorance of local cultural traditions is automatically removed. The problem of the appearance of the "fifth column" is supposed to be solved in this case by raising the general level of education of law enforcement officers, promoting among them general civic, not ethnic values. Law enforcement agencies in the regions of the Russian Arctic should be under greater control of the Center or regional authorities, because in the current situation with a vertical of power that exists de jure, but does not function de facto, it is often unclear who controls the actions of the security forces, and whether them anyone at all. In general, the task of protecting the population from the arbitrariness of the AZRF security forces, as in other regions of the Russian Federation, comes to the fore, replacing the task of combating organized crime, which is typical for the zero years of the 21st century. In this regard, one cannot fail to note the need to build relations with regional elites according to new principles, since it is obvious that the existing model of resource distribution between key clans in order to prevent a war of all against all is not effective enough. In general terms, the Mining region can begin work on the main areas of interaction with regional elites with the involvement of the expert community.

Fourth, finally, the priority of financing infrastructure projects, rather than aimless cash injections into the region, seems essential, moreover, infrastructure projects should be understood in a slightly different way, different from the understanding of the current government.

The need for infrastructure projects should also be assessed with the involvement of the expert community in various categories, among which there must be such a criterion as the need for the population and the ability of the population to use the new facility. Of particular importance for the regions of the Russian Arctic are the objects of social infrastructure (education, medicine, etc., according to these indicators, the regions of the Russian Arctic are significantly behind the average Russian values, and it is education and medicine that have a significant impact on the attitude of the population to power, satisfaction with life). In this context, it is proposed to give priority to social policy measures for the development of regions instead of investments in the real sector. In our opinion, the state is not able to effectively invest in the real sector, while the policy aimed at improving social capital (i.e. raising the level of education, the quality of medical services, etc.) brings really positive results. The strategy of the federal center must also be changed in terms of creating jobs - to move from direct or indirect budget financing of new jobs to creating favorable conditions for doing business, increasing the self-organization of citizens. This task is closely related to the reform of law enforcement agencies, and, in fact, is doomed without qualitative changes in the system of law enforcement agencies and the judiciary, as the main guarantors of the protection of private property. We consider it necessary to recall the importance of institutional changes in the region, which, in fact, are fundamental, since no "sustainable development" declared as the main task in the FTP, is impossible without normally functioning institutions. We see the

most effective and adequate method of competently combining traditional institutions with the all-Russian ones, so that the new institutions become an organic part of the cultural environment of the region and would not cause rejection.

Summing up, I would like to note that the strategic government documents on interaction with the regions of the Russian Arctic can be called insufficiently elaborated and of insufficient quality, namely:

Firstly, the degree of possible regulatory impact is reduced due to the lack of specific methods for achieving the set goals in the national program, despite the fact that the goals are very specific. Such a combination of specific goals and "blurred" methods leads to shifting the responsibility for achieving the goals exclusively to the regional authorities, who are forced to independently develop ways to achieve the targets;

secondly, a characteristic feature of government strategies is the fundamental disregard for regional specifics: despite the presence of descriptions of key regional problems in program documents, the analysis of regional specifics (institutional, cultural, social) is present only at the level of a “brief reference” about the region, which, of course, is not enough to develop an adequate strategy for socio-economic development.

It is curious that the analyzed strategic documents ignore not only the cultural characteristics of the North Caucasus region, which have a very serious impact on all spheres of life of these societies through existing institutional structures, but also socio-economic characteristics, such as the causes of unemployment and the specifics of employment in the region or availability of demand for sanatorium-tourist services. All of the above factors, as well as many others, have a significant impact on the process of implementing the strategy, and on the possible results of its implementation. In other words, without a comprehensive preliminary analysis of regional specifics, the development of a national strategy for the socio-economic development of the Russian Arctic regions looks like a political adventure. Initially, we were guided by the assumption that that the state policy in relation to the regions of the Russian Arctic does not take into account some important factors that negatively affect the results of the policy. It was assumed that the Center ignores cultural specifics because of its complexity and ambiguous impact on socio-economic processes, or because culture is not the “sphere of interest” of the Mines of the regions responsible for territorial development, however, it was found that the institutional features of the regions are also not taken into account in strategic documents. As a result, the results of applying the same measures in the Russian Arctic and in other parts of the Russian Federation can differ significantly, at least due to differences in the informal rules of the game, in stable working procedures. However, the socio-economic characteristics of the regions of the Russian Arctic, which are directly related to the jurisdiction of this department, analyzed by the Ministry of Regions, in strategic documents prepared by far from exhaustive. Ignoring regional peculiarities is not a distinctive feature of the Center's policy exclusively in relation to the Russian Arctic: regional cultural and institutional features are not taken into account when developing federal strategies and targeted programs, in principle, in relation to all regions of the Russian Federation. Another thing is that in the case of neglecting the cultural and political and economic specifics in relation to the regions of the Russian Arctic, it is superimposed on much more difficult conditions and leads to much more serious consequences - in the regions of the Russian Arctic, regional features simply cannot be ignored. Ignoring regional peculiarities is not a distinctive feature of the Center's policy exclusively in relation to the Russian Arctic: regional cultural and institutional features are not taken into account when developing federal strategies and targeted programs, in principle, in relation to all regions of the Russian Federation. Another thing is that in the case of neglecting the cultural and political and economic specifics in relation to the regions of the Russian Arctic, it is superimposed on much more difficult conditions and leads to much more serious consequences - in the regions of the Russian Arctic, regional features simply cannot be ignored. Ignoring regional peculiarities is not a distinctive feature of the Center's policy exclusively in relation to the Russian Arctic: regional cultural and institutional features are not taken into account when developing federal strategies and targeted programs, in principle, in relation to all regions of the Russian Federation. Another thing is that in the case of neglecting the cultural and political and economic specifics in relation to the regions of the Russian Arctic, it is superimposed on much more difficult conditions and leads to much more serious consequences - in the regions of the Russian Arctic, regional features simply cannot be ignored.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.771	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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ON THE IMPORTANCE OF THE QUALITY OF MANUFACTURED PRODUCTS FOR ITS DEMAND BY CONSUMERS IN THE REGIONS OF THE SOUTHERN FEDERAL DISTRICT AND THE NORTH CAUCASUS FEDERAL DISTRICT

Abstract: *in the article, the authors consider the most acute problem of the light industry - how to create the basis for a happy marriage between quality and the market, in order to please consumers in the regions of the Southern Federal District and the North Caucasus Federal District, which are in demand and have preference over other manufacturers. We justifiably give preference to product quality, since the dependence of the assortment on the market is relatively conditional and indirect, because it is "tied" to the technical state of production, technology and professionalism of developers. In the article, the authors explore the quality features of demanded products as a set of their properties that determine the suitability of this product to satisfy certain needs in accordance with their preferences. In our case, an object means not only a product or product, but also an activity, process, organization, system, that is, the needs and quality are limitless. Thus, high quality is a high degree of satisfaction of the requirements of all interested parties.*

Key words: *preference, demand, quality control, quality assessment, set of properties, product, product, object, satisfaction of requirements, market, competitiveness, priority, defects, their classification.*

Language: *English*

Citation: Blagorodov, A. A., Vilisova, M. L., Okhrimenko, O. I., Prokhorov, V. T., & Volkova, G. Yu. (2023). On the importance of the quality of manufactured products for its demand by consumers in the regions of the Southern Federal District and the North Caucasus Federal District. *ISJ Theoretical & Applied Science, 03 (119)*, 273-281.

Soi: http://s-o-i.org/1.1/TAS-03-119-36 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.36

Scopus ASCC: *2000.*

Introduction

UDC 519.14:685.74

Marketers agree that consumers give their main preferences to the quality of products. Market monitoring confirms the stable tradition of demand for quality goods. But not everything is so simple and obvious. The essence of the matter is that statistics is a pure operator and statistical data, therefore, they are absolutely dependent on the chosen conceptual description of the process. Statistical results are always correct, as they are obtained by using a proven mathematical apparatus, but correctness and truth are "two big differences."

For “correct” to be “true”, it is necessary to verify the entire chain of logical and mathematical actions for correctness. Certification is required not only for physical and software products. Parcel knowledge must also be certified, otherwise the defects of the initial judgments will migrate to the output knowledge. And no technology can fix the underlying flaw.

In the ideology of production, in particular, the production of direct consumption goods, the concept of “quality” should be a system-forming factor. We foresee the objection: “What is the use of quality if the quality criteria limit the quantity and the assortment of goods suffers from the priority of quality characteristics, the price rises?”, and we have an answer to opponents.

If the quality of the product is not ensured, then no quantity will improve the situation. It will be necessary either to agree with the obvious (for professionals) deception of the consumer, or to give up professional competence and deliberately lower quality requirements, allowing essentially low-quality goods to enter the market. As for the range, its dependence on product quality requirements is relatively conditional and indirect. The assortment is "tied" to the technical state of production, technology and professionalism of developers.

The more visible the features of a civilized market, the more urgent is the issue of quality. Moreover, the problem of quality has moved from the sphere of theoretical relevance to the level of practical relevance. Let's try to justify this shift in relation to Russian reality.

The official statistics of inflation are clearly sly, but even if we increase it by a factor of 0.5, and, having received a real average annual rate of 15–20%, we will have no choice but to state an increase in the well-being of the majority of fellow citizens in the context of a certain growth of the economy as a whole. The intensity of the dynamics is small, however, the fact itself is obvious.

That's just how fair it is to talk about "welfare"? Money is just an exchange equivalent. Making more money doesn't necessarily mean you'll live better. Money should be exchanged for necessary goods. And this is where the problem of quality comes into play. Having earned money, you can easily spend it "imperceptibly", i.e. to acquire not a product, but a “phantom of a product”. “Phantom of goods” is a non-specific concept for a special knowledge system. Nevertheless, it is necessary to get used to it as a theoretical expression of the realities of an undeveloped commodity market.

Speculating on the "white" and "gray" "spots" of the ideology of quality, which is in an extremely "neglected" state, "black" manufacturers of low-quality consumer goods, together with sympathetic officials of the services responsible for the quality of products, flooded the market with substandard products.

Main part

What is the essence of policy inefficiency in the economy of the end of the last and the beginning of the new century? This is question number 1, and it's not so much about who is to blame. We are interested in the essence of the political paradigm developed by those who were "at the helm". Question number 2 - what should be changed and how, apparently, it should be done in order to raise the national industry, the production of clothing, shoes, leather goods, textiles, accessories, not least?

The fate of the light industry now depends on what this last step will be. Its execution is the function of the Government. The political paradigm is extremely simple - we should not compete with anyone in the struggle for the global market, especially with the Chinese. The Chinese rightfully want to shoe and clothe the whole world. One fifth of the world's population lives in China. Our task is quite different. We need to make sure that the Chinese do not shoe or dress us. To transfer the purchasing demand to our own Russian production, to interest in goods produced in the country. Such a task is quite within our power, as the manufacturers say. And the Government needs to do its direct work consistently and in a timely manner, and not deceive the public in the light industry, as happened with the tailoring of school clothes.

The international quality control system "ISO 9000-2015" is more like the latest phenomenon of the famous Potemkin villages. Only what is clearly spelled out can be effectively controlled. Any incompleteness is a loophole for semi-legal penetration into the hunting fields for the consumer.

"ISO 9000-2015" should be used not as a management tool, but as a tool for the prevention of quality violations. The circle is thus closed, because the violation presupposes a quality, and it is the quality that we have not defined properly.

In the system of special knowledge, which is the ideology of production, "quality" is replaced by "state

of quality", which, in turn, is reduced to quantitative parameters.

Discrete expressions are given to quantitative characteristics - this is how another derivative concept appears. Only this time not from the root concept of "quality", but from its concept of "state of quality".

The militant activity of the desire to describe quality with the help of quantity is surprising. Almost two hundred years have passed since the time of Hegel, who argued that “quality is the main thing in the definition of a phenomenon, since quality is that, losing what it ceases to be itself,” almost two hundred years have passed. It's time to learn a simple truth: quality is determined not through quantity, but through properties. With the help of quantitative measurements, we need to determine the "measure" - "qualitative" and the "state of quality" (the level of expression of quality).

Errors in theory are rarely corrected by practice; on the contrary, it usually hides them up to a certain point in development. Defects in the theory in a rough form manifest themselves in difficult socio-economic circumstances, during times of political uncertainty.

It is no coincidence that such a peculiar time is "convenient" for the flourishing of theoretical uncertainty. The state, entangled in numerous problems, deviates from the control of economic processes, relying on the market, designed to put everything in its place. The market has its own laws of functioning. The market adapts the theory to suit its own interests. It does not obey the rules substantiated by theory, but seeks to adjust these rules to the way of relations with the consumer that is beneficial to it.

Product safety. Currently, in legislative acts and standards, safety requirements are singled out as a special group as a priority.

Product quality assurance is a set of planned and systematically carried out activities that create conditions for the production of products that meet consumer requirements. When implementing these measures, the factors influencing the formation and preservation of the quality of goods are taken into account.

The factors influencing the formation of the quality of goods include: studying the market for goods, developing requirements for goods, the quality of raw materials and materials, the quality of design and engineering, the quality of manufacturing, the quality of marking goods.

The factors that preserve the quality of goods include: packaging, conditions of transportation and storage, sale and consumption (operation), technical assistance in maintenance.

Factors that form consumer properties and quality of non-food products: chemical composition and properties of raw materials, structure of materials, design, production technology.

At the same time, the trends in the use of molded parts for the bottom of shoes are taken into account, although the possibility of implementing children's shoes with thread fastening methods is not excluded. In general, action is needed and the result will not keep you waiting.

In the last quarter of a century, the term "problem", pushing its "competitor" - "task" to the periphery - has firmly established itself in the verbal leaders of all discussions, regardless of their scale. The "problem" has become a kind of "brand", indicating a high professional stake in the discussion. In such a rapid ascent of the "authority" of the problem, one can easily find political roots. The current, obviously inflated status of the problem is an ideological move that provides a certain political line. Where a foreigner says: "problems", ours will definitely find them. If they don't find it, they'll invent it. Defects of qualification can be hidden behind a problem, problems lead politicians away from real cases, which they are unable to solve. In addition, hiding behind a problem, you add weight and mystery to the situation.

There is indeed an element of mystery in the politics of "problem". In the interpretation of the term, domestic classics: V.I. Dahl, R. Brockhaus and I. Efron point to this. Emphasizing the natural relationship between the “problem” and the “task”, they note the peculiarity of the problem, which manifests itself in its unusualness as a task: the task has a way of solving it in existence, the problem is also solved as a task, but so far there is no way to solve it. It exists conditionally, potentially. The interpretation of the problem by reducing the concept to a more general concept of "task" contains a hint for those who are aimed not at discussion, but at the solution. The solution to the problem should be sought by considering the problem as a complex task, composed of several coexisting in a complex or sequentially related tasks. What is important here is that a "problem" is not something inaccessible to ordinary thinking, it is the sum of tasks. Dealing with a problem is the same as deciphering this sum of solution problems, then simpler, already known problems combined in a problem. The problem should be presented as a technical problem. The solution of a technical problem is carried out in two ways: empirical or theoretical. All five of the simplest technical devices were created before Archimedes, even the “Archimedes screw”, however, all of them were the product of an experimental search based on trial and error, so their use and modernization, integration presented considerable difficulties. The merit of Archimedes was that the great ancient thinker developed the theory of these mechanisms, thereby helping to solve practical problems of various scales.

So, it is necessary to start with bringing the problem to a normal technical expression, i.e. try to present it in the form of a certain sum of tasks.

Why tasks? The answer, in essence, has already been given: the problem has a quantitative (normative)

expression, or it can be simplified to the possibility of a quantitative expression. The main thing is not to hide behind the quality of the problem, but to look for its equivalent quantitative expression.

The history of science naturally begins with mathematics, and the qualitative level of development of scientific knowledge is determined by the improvement of mathematics. In mathematics are the keys to the secrets of any discovery. DI. Mendeleev constantly emphasized: scientific knowledge begins with measurement. The normative form of scientific knowledge serves as a clear illustration of the importance for science of a quantitative description of a phenomenon. Finding a way to describe an event quantitatively means fulfilling a necessary condition in unraveling its qualitative existence.

A problem is a separation in the theory of the quality of a phenomenon. The next stage is already technical - the definition of regulatory characteristics. Normativity, represented by properties and quantitative parameters, allows thinking to engage in working, professional and practical work.

When developing normativity, they always experience the pressure of the need to match the set parameters with the quality features of the product. The correspondence between the norm and the property of quality is objectively relative, their coincidence is achieved conditionally, i.e. it takes place because the manufacturer himself determines the quality parameters of the product, often this is entrusted to expert organizations. But all the same, some model of quality is taken as quality. To put it simply, someone assigns quality. The real quality in such a completely acceptable scenario remains a transcendental formation.

Why did subjective and transcendent idealism turn out to be so in demand in various areas of non-philosophical professional activity? Because thinking professionals, including reflective engineers, scientists, and educators have found in them a solution to their specific issues. Someone decided not to complicate professional reflections by recognizing the supersensible as a reality, limiting themselves to a "model of quality", others thought about the fact that sensory reality would deprive us of a reliable intersubjective criterion of quality and doom us to eternal discussions on the topic "What is good and why is it not bad?" They accepted the idea of a transcendent, primary substance in relation to individual consciousness, which can direct professional thought with its logic. Of course, transcendent being will not put forward a formula for the concrete quality of a product, but the logical premises of the definition will inform. As a result, it will arm the professional search for qualitative certainty with the technology of thinking.

Design is one of the most important factors that determine the quality of finished products. Design is the shape, size, method of connection and interaction of parts and assemblies, "the relationship between individual elements, interchangeability, multi-operation and other features of the product. The design must ensure functionality, ergonomics, aesthetics, safety, reliability in the use and operation of products.

Production technology is a set of techniques, methods and operations for obtaining, processing raw materials, semi-finished products or products intended for the formation of basic consumer properties. Distinguish between the technology of plastics, metals, silicates, fibrous materials, mechanical engineering, construction, etc., as well as mechanical and chemical technologies.

Mechanical technology is associated with a change in the shape and a number of mechanical properties of processed materials: metal forming, cutting, stamping, pressing, etc.

Chemical technology is based on processes carried out as a result of chemical reactions and leading to a change in the chemical composition and structure of the starting materials: oil refining and obtaining oil products, wood processing to obtain artificial fibers, leather production technology, etc.

Under the influence of mechanical and chemical factors of the technological process, the properties of materials and goods may change. For example, by firing ceramic products, they are given hardness and mechanical strength. Metallization of plastic products improves aesthetics, increases impact resistance, reduces the tendency to aging, electrification. However, a violation of the technological processing regimes can lead to the appearance of defects that reduce the quality of goods. For example, a violation of the drying of ceramic products causes cracking, a violation of the cooling mode of molded plastic products - warping (distortion of the shape), etc.

Knowledge of the main processes and operations of technological processing allows the commodity expert to understand the origin of defects in goods, to make reasonable claims to manufacturers.

Quality assessment is a set of operations performed to assess the conformity of a particular product to established requirements. Requirements are established in technical regulations, standards, specifications, contracts, technical specifications for product design. The carrier of the established requirements can be standard samples, standard samples, analogous goods. Failure to comply is a nonconformity. The organization takes corrective action to eliminate the causes of nonconformity.

The main form of evaluation is control. Any control includes two elements: obtaining information about the actual state of the object (for products - about its qualitative and quantitative characteristics) and comparing the information received with the established requirements. When comparing, the correspondence or non-compliance of the actual values of quality indicators with the base ones is revealed. This operation ends with the establishment

of certain gradations, classes, commercial varieties, product brands, which, ultimately, is associated with the decision to assign a certain quality gradation to the product.

Gradation (class, grade) - a category or category assigned to objects that have the same functional application, but different quality requirements (GOST R ISO 9000-2015).

Products of different quality grades differ in price, which makes it possible to satisfy the needs of consumers of two categories: quality-sensitive and price-sensitive. In addition, the division of goods into quality gradations (higher and lower quality) makes it possible to rationally use natural, financial and labor resources that are not lost if low-quality products (for example, with acceptable defects) are sold at reasonable prices, and not destroyed. To make a final decision on the gradation of product quality, it is necessary to compare the actual and basic values for the entire range of selected indicators.

A standard product is a product that meets the established requirements for all selected indicators. If at least one of the determined indicators reveals a discrepancy, then the product cannot be assigned a standard gradation, but only a lower one - non-standard or defective.

Non-standard is a product that does not meet the established requirements for one or a set of indicators, but this discrepancy is not critical (dangerous).

Marriage - a product with identified removable or unrecoverable inconsistencies in one or a set of indicators. After elimination of inconsistencies, the gradation of the goods can be changed. If the elimination contributed to the improvement of all indicators to the established norm, the product is recognized as standard.

The grade of goods is determined by the quantity, type and values of tolerances. The same deviations in relation to a higher grade are qualified as defects (defects), to a lower grade - as permissible deviations. Such content is embedded in the concept of the variety of goods such as fabrics, garments and knitwear, shoes, dishes, haberdashery.

Complexity groups (highest, first, second) - gradations that differ in the technical level of quality indicators. These gradations are inherent in household radio equipment, depending on the magnitude of the acoustic parameters.

Brand gradations are accepted for construction, chemical and other goods. In one case, the division into grades reflects a measure of quality. In this case, the value of one or several quality indicators is taken as a basis: for cement and brick, compressive strength; for drawing paper - weight, weediness, fracture strength, number of erasures to be maintained. In another case (fuel, lubricating oils, steels, adhesives), the division into grades primarily reflects the scope. The gradations by quality groups (household soap, spring chipboards), quality categories (video cassettes), numbers (writing paper) are close in meaning to the gradation u0 brands, since the division is based on the normative value of a certain set of quality indicators.

Non-conformity and defects of goods

Non-compliance - non-compliance with requirements (GOST and ISO 9000-2011). One of the varieties of inconsistencies are defects.

Defect - non-fulfillment of the requirement associated with the intended or established use (GOST R ISO 9000-2011). These two concepts have a common feature - non-fulfillment of requirements. The difference lies in the fact that when defects are detected, legal liability arises if, due to their presence, the consumer cannot fully or partially use the defective product for its intended purpose. For example, canned food with a defect such as microbiological bombing cannot be used as food due to non-compliance with microbiological safety requirements. A variety of the concept of "discrepancy" can be considered the concept of "lack of goods". This term is regulated by the Law of the Russian Federation "On Protection of Consumer Rights".

“Deficiency of a product (work, service) is a non-compliance of a product (work, service) with the mandatory requirements provided for by law or in the manner prescribed by it, or with the terms of the contract, or with the purposes for which a product (work, service) of this kind is usually used or with the purposes, about which the seller (executor) was informed by the consumer at the conclusion of the contract or the sample and / or description when selling the goods according to the sample.

Defects are subdivided according to various criteria: the degree of significance, the availability of methods and means for their detection or elimination of the degree of harm caused, the place of detection.

The essence of our position lies in a new perspective of perception in the quality management of consumer goods - the interest of the consumer, more precisely, in the transformation of the consumer from a buyer into a producer. As long as the consumer is left to himself, he is formed in the market environment perverted by an unscrupulous manufacturer and advertising unsettled liability, he is a statistical value for a responsible producer. All plans of the manufacturer are based on statistical models, more or less indicative of the scale of the national economy, but not on the average capabilities of the enterprise. In order to replace virtual, speculative guidelines in planning with real, much more viable ones, it is necessary to take the consumer out of the zone of unlikely certainty into the space of cooperation, which gives, significantly, more probable forecast. From a spontaneous, opposing, divided by the "counter" subject, it is necessary to turn him into an accomplice through the education and enlightenment of consciousness.

The trouble with our current state is not in Chinese commodity expansion (the Chinese have flooded both the United States and half the world with their specific goods), but that we have left the consumer at the mercy of intermediaries.

Formally, such alienation looked quite logical and attractive: “To each his own!”. The shoemaker will sew what he has to - boots, shoes, sneakers, etc.; the merchant is busy with his business - the sale of goods; advertising has its profit by helping the merchant.

In reality, the producer found himself in isolation, submitting not to the market, but to market speculators and those who are in their service. The market is a relation within the “producer-consumer” system. Anything that is built between them breaks their natural relationship. Leading European manufacturers do not allow themselves to supply products to our market. They enter the market themselves, with their network of specialized stores, which are under strict control and carry out independent advertising work with the consumer. By replacing the "consumer" with the "buyer", businesses form an uncertain perspective. The producer, by his dialectical opposite, has a consumer, not a buyer. The consumer also needs to be connected to the problem of technical regulation: to teach him industrial literacy, to educate.

Figure 1 - The structure of light industry

In 2022, the gross domestic product (newly created value) decreased by 9.9% compared to the corresponding period in 2021 (in 2020, it increased by 7.3% over the same period).

A sharp decrease in the financial result is a consequence of both a decrease in profits and, most importantly, a consequence of a significant increase in losses. For 2020, in the textile, clothing, fur production, profit was 1.9% less than in 2019, and losses increased by 50.3%. In the production of leather, footwear and leather products, profits increased by 3.9%, and losses by 2.2 times. The decline in profits in the production of textiles, clothing and fur products is less than the decrease in the number of profitable enterprises (7.9 and 12.5%, respectively), and in the production of leather, footwear and leather goods, profits even increased by 10.9% with a decrease in the number of profitable enterprises by 8.6%. This indicates, that profitable enterprises became unprofitable and the profit at one remaining profitable enterprise increased on average. The share of profitable enterprises is 62.4% and 73% in production (average 63.4% in manufacturing). The amount of losses in 2021, on average, at one unprofitable enterprise increased. Accounts receivable in the textile, clothing and fur industry for 2021 was 25.8 billion rubles. (0.1 billion rubles more than in 2020). At the same time, overdue accounts receivable even decreased from 4 billion rubles. in 2020 up to 3.9 rubles. V The amount of losses in 2021, on average, at one unprofitable enterprise increased. Accounts receivable in the textile, clothing and fur

industry for 2021 was 25.8 billion rubles. (0.1 billion rubles more than in 2020). At the same time, overdue accounts receivable even decreased from 4 billion rubles. in 2020 up to 3.9 rubles. V The amount of losses in 2021, on average, at one unprofitable enterprise increased (losses increased by production by 63.3% and 2.3 times, while the number of unprofitable enterprises increased by 31 and 34%).

Such a transformation, despite all its conventionality, is not so harmless for objectivity in understanding. Even such an excellent thinker as G. Hegel sinned, voluntarily or involuntarily substituting his opponents in order to make it easier to criticize them. The quality of "it is written" to be at the epicenter of both scientific and amateurish reflections at all times. The problem of ensuring the quality of activities is not just universally relevant, it is strategic. The dilemma in relation to quality is reasonable only within the limits of the opposition of the ratio of actions "immediate" and "indirect". The saying "it's all about him" owes its origin to quality. It is possible to "forget" about the problem of quality solely because any fruitful and luminous activity is ultimately aimed at improving quality. Quality is either "on the mind" or "implied".

The quality of activity is the final criterion of its individual, collective and national status. It is in quality that the energy of creation is accumulated. The quality of activity shows how much we penetrated into the essence of things, learned how to manage things, change their properties, form, forcing them to serve a person without significant damage to nature. Quality allows you to see the person himself from new angles, to pay tribute to his talent, will, and professionalism. Studies conducted under the UN Development Program have measured the share of the "human factor" in national and global wealth: 65% of the wealth of the world community is the contribution of human potential, and only a third of the world's wealth comes from natural resources and the production structure. A quality-oriented strategy is undoubtedly contributes to the growth of the very role of the subjective factor in the development of production, and to a more complete and comprehensive satisfaction of human needs themselves. The desire to "live according to reasonable needs", as well as the need to "work according to one's capabilities", together with the communist ideal, no one dared to openly and officially cancel, realizing the absurdity of denying the essential forces of man. In a "hot" state, the problem of quality is sustainably supported by both the internal forces of active consciousness and external life factors. The highest function of consciousness is cognitive. Knowing nature, we discover its qualities, state of quality, quality levels, embodying new knowledge in production. Classical political economy (A. Smith, D. Riccardo, K. Marx, J. Mill) concentrated quality problems in production. Post-classical economic thought shifted quality towards consumption, trying to give production a "human face" – a person alienates himself in the production process, but this measure is forced and, in a systemic sense, is temporary, conditional. Labor is a kind of "terrible boilers" that Vanya the Fool had to overcome in order to turn into Ivan Tsarevich. The main thing in production is the result, not the process. Consumption regulates the market. Therefore, the demands of the market must dominate production. The task of the society is to contribute worldwide to the development of demand in the market: to maintain the range of goods, stimulate price stability, increase purchasing power, improve the quality of goods. E. Deming, calling the "network of deadly diseases" of modern production, puts in the first place "production planning, not focused on such goods and services for which the market shows demand. Try to answer him. Production in the transition from industrial to post-industrial society of mass consumption is conceived as a function of the market.

Conclusion

Quality control is of great importance in the manufacture of goods, their storage, transportation, sale and disposal.

As noted above, quality control is a verification of the compliance of quality indicators with established requirements, which are defined in the relevant regulatory documents (standards, norms, rules, etc.) or in technical specifications. When making transactions, these documents are equated with the Contract Terms in the "Quality Requirements" section, basic and special delivery conditions, etc.

Quality control is carried out at different stages of the product life cycle, and the types and objectives of control at each stage may be different. At the production stage, quality control is carried out by the manufacturer. The purpose of such control is the rejection of low-quality products, as well as the establishment of the causes of defects. Careful control is beneficial to the manufacturer.

At the stage of circulation, quality control is carried out to check the safety of goods during storage, transportation, and sale. Quality control is most important when transferring goods from one party to another, for example, in purchase and sale transactions, etc. These operations are carried out, as a rule, in accordance with the instructions "On the procedure for accepting industrial and technical products and consumer goods by quantity" and "On the procedure for the acceptance of products for industrial purposes and consumer goods in terms of quality."

When delivering goods, in order to maintain its quality and create conditions for timely and correct acceptance of quality, the seller should ensure:

- compliance with the rules for packing and packing products, marking and sealing individual places;
- clear and correct execution of documents certifying the quality of the supplied products (technical passport, certificate of conformity, specification), shipping and settlement documents, compliance of the data indicated in them with the actual quality of the supplied products;
- timely sending to the buyer (consignee) of documents certifying the quality of the goods;
- compliance with the rules for the delivery, loading and securing of goods.

Acceptance and delivery of goods is a section of the contract of sale, which describes the procedure for the delivery and acceptance of goods:

a) type of acceptance (preliminary and final);

b) the date of delivery and acceptance (in terms of quantity and quality);

c) the place of actual delivery and acceptance;

d) quality acceptance method;

e) method for determining the quantity and quality of the goods actually delivered;

e) who carries out the delivery and acceptance of the goods.

Acceptance - verification of the conformity of the quality, quantity and completeness of the goods with their characteristics and technical conditions specified in the contract of sale. The content of the article of the contract (agreement) on the acceptance of goods in terms of quality and quantity depends primarily on the basic delivery terms accepted by the parties, as well as on the nature of the goods themselves.

The basic delivery condition determines the place of acceptance. So, if the parties have chosen the EXW condition (a term from the Incoterms directory), then the place of acceptance of the goods will be the territory of the plant. Under the FAS condition, the place of acceptance is the pier along the side of the ship, where, under this condition, the seller must store the goods. Thus, the delivered goods are accepted in terms of quality and quantity at the moment and in the place when and where the transfer of ownership of the goods and the risk of its accidental loss or damage occurs from the seller to the buyer. The nature of the product determines the content of the actions to check its quality and quantity.

If the product is complex equipment, machine tools, machines, its quality acceptance implies not only an external examination, but also a check of at least part of the product in operation. In this case, the buyer should be given the right to file quality complaints within a sufficiently long period of time - 6 - 12 months.

If the goods are food, food, quality acceptance consists mainly in inspection and examination, as well as in the verification of documents certifying quality, production date, expiration date, etc.

Acceptance of goods for quality can be carried out in two ways: on the basis of a document confirming the compliance of the quality of the delivered goods with the terms of the contract, and by checking the quality at the place of acceptance. Quantity and quality checks can be carried out selectively or on the entire delivered goods.

When using the first method, the contract establishes the percentage of the entire consignment of goods to be verified. In the contract, it is necessary to stipulate by whom the delivery and acceptance of the goods is carried out. A clause may be made in the sales contract that, with the consent of the importer, the exporter has the right to deliver the goods without quality control.

Example. “The goods sold under this contract will be considered delivered by the Seller and finally accepted by the Buyer:

By gross weight and number of pieces according to the bill of lading (either an air waybill, or a road waybill, or a railway waybill, or a postal receipt).

By net weight and other specified units according to the shipping specification (either weight certificate or packing list).

In terms of quality according to the manufacturer's quality certificate or the Seller's guarantee letter.

The place of acceptance and delivery of goods is considered to be the port of shipment - St. Petersburg.

The rules for acceptance of certain types of products are established in the regulatory document - the standard technical conditions for products, in the section of the same name. The rules include the procedure for product control, the procedure and conditions for the presentation and acceptance of products by the technical control bodies of the manufacturer and the consumer (customer), the size of the presented batches, the need and time for holding the products before acceptance, the list of accompanying presentation documentation, as well as the procedure for formalizing the results of acceptance.

Depending on the nature of the product, test programs are established (for example, acceptance, periodic, typical, reliability), and also indicate the procedure for using (storage) the products that have passed the test, the need for selection and storage, samples for repeated (additional) testing, etc. . P.

For each category of tests, the frequency of their conduct, the number of controlled samples, the list of controlled parameters, norms, requirements and product characteristics and the sequence in which control is carried out are established.

In case of selective, or statistical, quality control, a control plan is indicated (the volume of the controlled lot, the volume of samples for piece or samples for non-piece products, control standards and

decision rules). The section stipulates the rules and conditions for acceptance, the procedure and conditions for rejecting products and resuming acceptance after analyzing the identified defects and eliminating them. The section specifies the procedure and conditions for the final rejection of products. In the same place, if necessary, the procedure and place for affixing stamps, stamps, seals, confirming the acceptance of products by control bodies, is established.

The dynamics of the market development in the last decades of the last century and at the beginning of the third millennium invariably shows the growing interest of consumer demand in the quality of goods. With all the economic, social and political costs, humanity is getting richer and wealth is distributed unevenly. Finances, as before, are concentrated in certain regions, however, just like the premieres of modern production. Analysts predict the course for the quality of goods confidently and everywhere. The consumer has realized the need to pay for the advantage of quality services and products. It is the turn of the manufacturer, who must overcome "greed" and "mortal sin" in order to destroy greed. The most prominent economists unambiguously declare that the improvement in the quality of goods is not connected, causally, with an increase in prices. Positive changes in the quality of goods require qualitative changes in engineering, technology, organization and management of production. Production must improve, but not become more costly.

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Impact Factor:					
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	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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FINDING PSEUDOSOLUTIONS OF A LINEAR SYSTEM OF ALGEBRAIC EQUATIONS IN MAPLE

Abstract: *An inconsistent m of linear algebraic n equations have no solution in the usual sense. In this connection, the notion of a pseudo-solution of the system is introduced, and together with it, the methods of finding such solutions are considered. To date, an urgent scientific direction - computer mathematics - has received a rapid development of systems. Defining it as a set of, algorithmic, hardware and software tools designed for efficient solving on a computer of all kinds of mathematical problems, including symbolic transformation and calculations with a high degree of visualization of all kinds of calculations considered finding pseudo-solutions in these systems. The use of computer mathematics systems will significantly expand the possibilities of automating all stages of mathematical modeling.*

Key words: *pseudo-matrix, pseudo-solution, normal pseudo-solution, least squares method, skeleton decomposition of matrix, rank of matrix.*

Language: *English*

Citation: Krahmaleva, Yu. R., & Esenalieva, A. (2023). Finding pseudosolutions of a linear system of algebraic equations in maple. *ISJ Theoretical & Applied Science, 03 (119),* 282-289.

Soi: http://s-o-i.org/1.1/TAS-03-119-37 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.03.119.37

Scopus ASCC: *2600.*

Introduction

МРНТИ 27.17.29:

The solution of many problems of mathematical physics and mathematical modeling of complex physical and chemical phenomena and processes are reduced to the solution of appropriate systems of linear algebraic equations. In this case, there is a need to take into account the degree of influence of inaccuracies in the initial data on the result of the obtained solutions and in the case where systems of equations with imprecise initial data have an exact absolute solution. Because of this, the influence of inaccuracies in the initial data has a specific nature and even minor inaccuracies of random nature can lead to the fact that the obtained solutions and the true ones will have a strong difference. In case the system is inconsistent, the mathematical model is corrected and a pseudo-solution or a generalized solution of the system is considered. One of the methods of finding a pseudo-solution of the system is the method of least squares.

Let us consider a system of linear algebraic equations that is inconsistent:

$$\begin{cases} a_{11}x_1 + a_{12}x_2 + \ldots + a_{1n}x_n = b_1 \\ a_{21}x_1 + a_{22}x_2 + \ldots + a_{2n}x_n = b_2 \\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ a_{m1}x_1 + a_{m2}x_2 + \ldots + a_{mn}x_n = b_m \end{cases} \quad (1)$$

where $x_1, x_2, \ldots, x_n$ - unknown, a_{ij} - coefficients at the unknowns, $b_1, b_2, \ldots, b_m$ - free terms, which in matrix form is:

$$A \cdot X = B, \quad (2)$$

where $A=\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{pmatrix}$ - system matrix, $B=\begin{pmatrix} b_1 \\ b_2 \\ ... \\ b_m \end{pmatrix}$ - matrix of free terms, $X=\begin{pmatrix} x_1 \\ x_2 \\ ... \\ x_n \end{pmatrix}$ - matrix of unknowns.

He problem of finding such values of the unknowns $(x_1, x_2,..., x_n)$ that the function $F(x)$ form [1]:

$$F(x)=|Ax-b|^2=\sum_{i=1}^{m}\left|\sum_{j=1}^{n}a_{ij}\,x_j\right|^2, \qquad (3)$$

where $(x_1, x_2,..., x_n)$ takes the smallest value and is the essence of the method of least squares, and $(x_1, x_2,..., x_n)$ in this case represents pseudosolutions of the considered system (1)-(2). To find pseudosolutions, we consider the system [1]:

$$A^T\cdot A\cdot X=A^T\cdot B, \qquad (4)$$

which is obtained from the original system (1)-(2) by multiplication of the transpose matrix A^T to the original matrix A. We find a general solution of system (4), which is a general pseudosolution of system (1)-(2).System (4) is called a system of normal equations and it is always joint. A pseudosolution that has minimal norm is defined as a normal pseudosolution of the system (1)-(2) [2].

Another method of finding pseudo-solutions of the SLAE is based on the application of the pseudo-matrix to the original matrix of the system. In this case, the general pseudo-solution of the system (1)-(2) can be represented in the form [2]:

$$X_{обнеод}=A^+\cdot B+\left(E-A^+\cdot A\right)\cdot C, \qquad (5)$$

where $A^+\cdot B=X^0$ is a normal pseudosolution of the system, $\left(E-A^+\cdot A\right)\cdot C=X_{обнод}$ is a general pseudosolution of the homogeneous system corresponding to system (1)-(2), B is a matrix of free terms, E is a unit matrix corresponding to the order, C is a vector of arbitrary constants [2].

The pseudo-matrix exists for any matrix and is the only one.

If the rank of matrix A coincides with the number of its rows, i.e. $r(A)=m$, then the pseudo matrix A^+ has the form:

$$A^+=A^T\cdot\left(A\cdot A^T\right)^{-1}, \qquad (6)$$

where A^T is a transposed matrix. If the rank of matrix A is the same as the number of its columns, i.e. $r(A)=n$, then the pseudomatrix A^T has the form:

$$A^+=\left(A^T\cdot A\right)^{-1}\cdot A^T, \qquad (7)$$

In the general case, if the matrix A is represented by a skeleton decomposition: $A=B\cdot C$, then A^+ has the form:

$$A^+=C^T\left(C\cdot C^T\right)^{-1}\cdot\left(B^T\cdot B\right)^{-1}\cdot B^T. \qquad (8)$$

To solve the problems of linear algebra in modern systems of computer mathematics there are libraries of programs, the implementation of the algorithms of which is based on mathematical reasoning. The possibility of solving such problems in the Maple system arises, taking into account the labor intensity of matrix calculations, which increases with increasing dimensionality of matrices. In this .article, we will implement the method of least squares for finding a pseudo-solution of systems of linear algebraic equations in the Maple system. We will investigate and find the solution of the system of linear algebraic equations:

$$\begin{cases} x_1-x_2=6, \\ -x_1+2x_2+x_3=6, \\ 2x_1-3x_2-x_3=-9, \\ x_2+x_3=18. \end{cases}$$

We set the initial data and connect the specialized package for solving linear algebra problems in Maple: *LinearAlgebra* [3]:

```
restart;
with(LinearAlgebra);
a11 := 1 : a12 := -1 : a13 := 0 : b1 := 6 : a21 := -1 : a22 := 2 : a23 := 1 : b2 := 9 :
a31 := 2 : a32 := -3 : a33 := -1 : b3 := -9 : a41 := 0 : a42 := 1 : a43 := 1 : b4 := 18 :
s1 := {a11·x1 + a12·x2 + a13·x3 = b1, a21·x1 + a22·x2 + a23·x3 = b2, a31·x1 + a32·x2
    + a33·x3 = b3, a41·x1 + a42·x2 + a43·x3 = b4};
A := Matrix(4, 3, [a11, a12, a13, a21, a22, a23, a31, a32, a33, a41, a42, a43]); rA
    := Rank(A);
B := Matrix(4, 4, [a11, a12, a13, b1, a21, a22, a23, b2, a31, a32, a33, b3, a41, a42, a43, b4]);
  rB := Rank(B);
n := ColumnDimension(A);
```

To investigate this system we will use the Kronecker-Capelli theorem, for this purpose the program will contain 3 cycles. The first cycle establishes the coherence of the original system [3]:

```
if rB = rA then rs := rB; print ('SLAY_sovmestnaya'); else print('SLAY_nesovmestnaya'); fi;
```

The second circular path determines the solution of a certain SLAE, which is possible if the ranks of the matrix of the system A and the extended matrix of the system B and the number of unknowns are equal [3]:

```
if rB = rA and rB = n then print('Sistema_sovmestna_i_opredelennaya');
B1 := Matrix(4, 1, [b1, b2, b3, b4]);
ObA := MatrixInverse(A);
X := MatrixMatrixMultiply(ObA, B1);
x11 := X[1, 1]; x22 := X[2, 1]; x33 := X[3, 1]; x44 := X[4, 1];
PR := subs(x1 = x11, x2 = x22, x3 = x33, x4 = x44, s); fi;
```

The third cycle is responsible for finding a solution to the uncertain system, which is found if the ranks of matrix of the system A and the extended matrix of the system B are equal, but these ranks are less than the number of unknowns [3]:

```
if rB = rA and rB < n then print('Sistema_sovmestna_i_ne_opredelennaya');
B1 := Matrix(4, 1, [b1, b2, b3, b4]);
X := LinearSolve(A, B1);
x11 := X[1, 1]; x22 := X[2, 1]; x33 := X[3, 1]; x44 := X[4, 1];
PR := subs(x1 = x11, x2 = x22, x3 = x33, x4 = x44, s1); fi;
```

As a result of the program we have:

$$s1 := \{x1 - x2 = 6, x2 + x3 = 18, -x1 + 2x2 + x3 = 9, 2x1 - 3x2 - x3 = -9\}$$

$$A := \begin{bmatrix} 1 & -1 & 0 \\ -1 & 2 & 1 \\ 2 & -3 & -1 \\ 0 & 1 & 1 \end{bmatrix}$$

$$rA := 2$$

$$B := \begin{bmatrix} 1 & -1 & 0 & 6 \\ -1 & 2 & 1 & 9 \\ 2 & -3 & -1 & -9 \\ 0 & 1 & 1 & 18 \end{bmatrix}$$

$$rB := 3$$

$$n := 3$$

$$SLAY\_nesovmestnaya$$

As we see, the original SLAE is inconsistent. To implement the method of least squares it is necessary to perform matrix calculations, according to equality (4): 1) transpose the matrix of the system: At; 2) multiply matrices At and AX on the left, preliminarily entering matrix X; 3) multiply At and $B1$ on the left, where $B1$ is the matrix of free members; 4) make a system of linear algebraic equations, the elements of the left part of which will be the result of multiplication of matrices of the left part of equality (4): $A^T \cdot A \cdot X$, the elements of the right part are the result of multiplication of the matrices of the right part of equality (4) [1]: $A^T \cdot B$. These calculations are performed in the first cycle of the program described above [3]:

```
if rB = rA then rs := rB; print ('SLAY_sovmestnaya');
else print('SLAY_nesovmestnaya');
At := Transpose(A);
X := Matrix(3, 1, [x1,x2,x3]);
AX := MatrixMatrixMultiply(A,X);
AtAX := MatrixMatrixMultiply(At,AX);
B1 := Matrix(4, 1, [b1,b2,b3,b4]);
AtB1 := MatrixMatrixMultiply(At,B1);
s2 := {AtAX[1,1] = AtB1[1,1], AtAX[2,1] = AtB1[2,1], AtAX[3,1] = AtB1[3,1]};
fi;
```

As a result of the program functioning, we have:

$$AtAX := \begin{bmatrix} 6\,x1 - 9\,x2 - 3\,x3 \\ -9\,x1 + 15\,x2 + 6\,x3 \\ -3\,x1 + 6\,x2 + 3\,x3 \end{bmatrix}$$

$$AtB1 := \begin{bmatrix} -21 \\ 57 \\ 36 \end{bmatrix}$$

$$s2 := \{-9\,x1 + 15\,x2 + 6\,x3 = 57,\ -3\,x1 + 6\,x2 + 3\,x3 = 36,\ 6\,x1 - 9\,x2 - 3\,x3 = -21\}$$

We got the system $s2$:

$$\begin{cases} -9x_1 + 15x_2 + 6x_3 = 57, \\ -3x_1 + 6x_2 + 3x_3 = 36, \\ 6x_1 - 9x_2 - 3x_3 = -21. \end{cases}$$

For the system $s2$ we use the program of research and finding solutions of the SLAE according to the Kronecker - Capelli theorem, according to which the set of pseudosolutions of the original system $x11$, $x22$, $x33$ is obtained:

$$s1 := \{-9\,x1 + 15\,x2 + 6\,x3 = 57,\ -3\,x1 + 6\,x2 + 3\,x3 = 36,\ 6\,x1 - 9\,x2 - 3\,x3 = -21\}$$

$$A := \begin{bmatrix} -9 & 15 & 6 \\ -3 & 6 & 3 \\ 6 & -9 & -3 \end{bmatrix}$$

$$rA := 2$$

$$B := \begin{bmatrix} -9 & 15 & 6 & 57 \\ -3 & 6 & 3 & 36 \\ 6 & -9 & -3 & -21 \end{bmatrix}$$

$$rB := 2$$

$$n := 3$$

$$rs := 2$$

$$print\ SLAY\_sovmestnaya$$

$$Sistema\_sovmestna\_i\_ne\_opredelennaya$$

$$B1 := \begin{bmatrix} 57 \\ 36 \\ -21 \end{bmatrix}$$

$$X := \begin{bmatrix} 22 - \_t_{1,1} \\ 17 - \_t_{1,1} \\ \_t_{1,1} \end{bmatrix}$$

$$x11 := 22 - \_t_{1,1}$$

$$x22 := 17 - \_t_{1,1}$$

$$x33 := \_t_{1,1}$$

To obtain a normal pseudo-solution in the third cycle: 1) we form a function $F(x)$, using (3); 2) we find the minimum point of the function $F(x)$, with respect to the free unknown ; 3) we substitute the minimum point in the found solutions [1], [4]:

```
if rB = rA and rB < n then print('Sistema_sovmestna_i_ne_opredelennaya');
B1 := Matrix(3, 1, [b1, b2, b3]);
X := LinearSolve(A, B1);
x11 := X[1, 1]; x22 := X[2, 1]; x33 := X[3, 1];
F := (x11)^2 + (x22)^2 + (x33)^2;
Fc := subs(_t1, 1 = c, F);
Diff(Fc, c) = diff(Fc, c);
c1 := solve(diff(Fc, c) = 0, c);
x111 := subs(_t1, 1 = c1, x11);
x222 := subs(_t1, 1 = c1, x22);
x333 := subs(_t1, 1 = c1, x33);
PR := subs(x1 = x111, x2 = x222, x3 = x333, s1);
fi;
```

$$F := (22 - \_t_{1,1})^2 + (17 - \_t_{1,1})^2 + \_t_{1,1}^2$$

$$Fc := (22 - c)^2 + (17 - c)^2 + c^2$$

$$\frac{d}{dc}\left((22 - c)^2 + (17 - c)^2 + c^2\right) = -78 + 6c$$

$$c1 := 13$$

$$x111 := 9$$

$$x222 := 4$$

$$x333 := 13$$

$$PR := \{-21 = -21, 36 = 36, 57 = 57\}$$

A normal pseudo-solution of the original system is obtained:

$$X = \begin{pmatrix} 9 \\ 14 \\ 13 \end{pmatrix}.$$

Let us consider finding pseudo-solutions of the SLAE using the pseudo-matrix system in the Maple system of computer mathematics. Enter the initial data and connect the specialized package for solving linear algebra problems in Maple: LinearAlgebra:

```
restart;
with(LinearAlgebra);
a11 := 1 : a12 := -1 : a13 := 0 : b1 := 6 : a21 := -1 : a22 := 2 : a23 := 1 : b2 := 9 :
a31 := 2 : a32 := -3 : a33 := -1 : b3 := -9 : a41 := 0 : a42 := 1 : a43 := 1 : b4 := 18 :
s1 := {a11·x1 + a12·x2 + a13·x3 = b1, a21·x1 + a22·x2 + a23·x3 = b2, a31·x1 + a32·x2
    + a33·x3 = b3, a41·x1 + a42·x2 + a43·x3 = b4};
A := Matrix(4, 3, [a11, a12, a13, a21, a22, a23, a31, a32, a33, a41, a42, a43]);
B1 := Matrix(4, 1, [b1, b2, b3, b4]);
```

Considering the skeleton decomposition of the system matrix, we calculate the rank, determine the number of rows and columns of the matrix of A system [3]:

```
rA := Rank(A); mA := RowDimension(A); nA := ColumnDimension(A);
```

Let us make the first cycle in which the rank of matrix A is equal to the number of its rows. According to the theory, we assume $C = A$, then 1) multiply matrix C and transpose matrix C^T and get matrix CC^T, 2) find inverse matrix OCC^T for matrix CC^T, 3) make matrix PC by multiplying matrix C^T and OCC^T, 3) make matrix B by multiplying matrix A and PC, thus skeleton expansion of matrix $A = B \cdot C$ is obtained, where B is unit matrix, and $C = A$. Let us compose the

pseudo matrix PsA by the algorithm of formula (6) , [5],[6]:

if $rA = mA$ **then** $C := A$;
$CCT := Multiply(C, Transpose(C))$;
$OCCT := MatrixInverse(CCT)$;
$PC := Multiply(Transpose(C), OCCT)$;
$B := Multiply(A, PC)$;
$A1 := Multiply(B, C)$;
$BTB := Multiply(Transpose(B), B)$;
$OBTB := MatrixInverse(BTB)$;
$PB := Multiply(OBTB, Transpose(B))$;
$PsA := Multiply(PC, PB)$;
fi;

By analogy let us make a second cycle in which the rank of matrix A is equal to the number of columns. The pseudo matrix PsA will be made by the algorithm of formula (7) [1]:

if $rA = nA$ **then** $C := A$;
$CTC := Multiply(Transpose(C), C)$;
$OCTC := MatrixInverse(CTC)$;
$PC := Multiply(OCTC, Transpose(C))$;
$B := Multiply(PC, A)$;
$A1 := Multiply(C, B)$;
$BTB := Multiply(Transpose(B), B)$;
$OBTB := MatrixInverse(BTB)$;
$PB := Multiply(OBTB, Transpose(B))$;
$PsA := Multiply(PC, PB)$;
fi;

In the general case, let us form the third cycle, in which $r(A) \neq m$ and $r(A) \neq n$ and $n - m = 1$, unlike the first and second cycles, the matrix G, which is reduced to the triangular form by the Gauss elimination method, and the matrix C will be obtained by deleting the row equal to m (the number of rows of matrix A). The pseudo matrix PsA is formed by the algorithm of formula (8) [1]:

if $rA \neq nA$ **and** $rA \neq mA$ **and** $nA - mA = 1$ **then** $G := GaussianElimination(A)$;
$C := DeleteRow(G, mA)$;
$rC := Rank(C)$;
$CCT := Multiply(C, Transpose(C))$;
$OCCT := MatrixInverse(CCT)$;
$PC := Multiply(Transpose(C), OCCT)$;
$B := Multiply(A, PC)$;
$A1 := Multiply(B, C)$;
$BTB := Multiply(Transpose(B), B)$;
$OBTB := MatrixInverse(BTB)$;
$PB := Multiply(OBTB, Transpose(B))$;
$PsA := Multiply(PC, PB)$;
fi;

The program also takes into account the general case where $r(A) \neq m$ and $r(A) \neq n$ and $m - n = 1$, in which, unlike the third cycle, matrix $C1$ is formed by sequentially deleting a row equal to m (the number of rows of matrix A) from matrix G and deleting a row equal to n (the number of columns of matrix A) from the resulting matrix [7], [3]:

if $rA \neq nA$ **and** $rA \neq mA$ **and** $mA - nA = 1$ **then** $G := GaussianElimination(A)$;
$C := DeleteRow(G, mA)$;
$C1 := DeleteRow(C, nA)$;
$rC1 := Rank(C1)$;
$C1C1T := Multiply(C1, Transpose(C1))$;
$OC1C1T := MatrixInverse(C1C1T)$;
$PC1 := Multiply(Transpose(C1), OC1C1T)$;
$B := Multiply(A, PC1)$;
$A1 := Multiply(B, C1)$;
$BTB := Multiply(Transpose(B), B)$;
$OBTB := MatrixInverse(BTB)$;
$PB := Multiply(OBTB, Transpose(B))$;
$PsA := Multiply(PC1, PB)$;
fi;

As we see, the program contains all cases of construction of the skeleton decomposition of the matrix of the system, and as a consequence the construction of the pseudo-matrix of the system. To find the general pseudosolution X_{obns} of the system, we find X_{chns} - the normal pseudosolution of the system, $\left(E - A^{+} \cdot A\right) \cdot C = X_{odns}$ - the general pseudosolution of the homogeneous system corresponding to system (1)-(2) and sum up [9], [10]:

$PsAA := Multiply(PsA, A)$;
$E := IdentityMatrix(3)$;
$EPsAA := MatrixAdd(E, Multiply(PsAA, -1))$;
$MPC := Matrix(3, 1, [C1, C2, C3])$;
$Xodns := Multiply(EPsAA, MPC)$;
$Xchns := Multiply(PsA, B1)$;
$Xobns := MatrixAdd(Xodns, Xchns)$;

$$Xodns := \begin{bmatrix} \frac{1}{3} C1 + \frac{1}{3} C2 - \frac{1}{3} C3 \\ \frac{1}{3} C1 + \frac{1}{3} C2 - \frac{1}{3} C3 \\ -\frac{1}{3} C1 - \frac{1}{3} C2 + \frac{1}{3} C3 \end{bmatrix}$$

$$Xchns := \begin{bmatrix} 9 \\ 4 \\ 13 \end{bmatrix}$$

$$Xobns := \begin{bmatrix} \frac{1}{3} C1 + \frac{1}{3} C2 - \frac{1}{3} C3 + 9 \\ \frac{1}{3} C1 + \frac{1}{3} C2 - \frac{1}{3} C3 + 4 \\ -\frac{1}{3} C1 - \frac{1}{3} C2 + \frac{1}{3} C3 + 13 \end{bmatrix}$$

As we see, the normal pseudosolutions of the system obtained by the considered methods coincide.

The developed programs for finding pseudosolutions of systems of linear algebraic equations are automated and can be successfully used in scientific research. The advantages of the programs include minimal time consumption of their application, efficiency and solution accuracy.

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	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 03 **Volume:** 119

Published: 30.03.2023 **http://T-Science.org**

Issue Article

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DEMOCRATIC PRINCIPLES-AS AN IMPORTANT STRUCTURE FOR THE UNDERSTANDING OF THE NATIONAL SELF

Abstract: *The analysis of democratic principles being an important structure in national self-awareness is given by the example of independent Uzbekistan.*

Key words: *democracy, common to all mankind democratic principles, values, national, human, regional, international understanding, religious tolerance, national self-awareness.*

Language: *English*

Citation: Saparov, B. B., & Ikramov, R. A. (2023). Democratic principles-as an important structure for the understanding of the national self. *ISJ Theoretical & Applied Science, 03 (119),* 290-292.

Soi: http://s-o-i.org/1.1/TAS-03-119-38 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2023.03.119.38

Scopus ASCC: *3300.*

Introduction

Nationalism and generalism are required to be harmonious in the perception of the national self, and thus universal democratic principles are an important structure in the perception of the national self. Universal democratic principles are manifested through universal values. Universal values are a generalized expression of national and regional values. Universal values, based on universal principles, are formed and developed on the basis of values inherent in the whole of humanity. They simultaneously serve the development of the convergence, progress of all national values, the realization of the national identity of peoples.

"The greatest priceless wealth we have achieved in the years of independence," our President Sh.Mirziyoev, - the ability of our multinational people to overcome any difficulties and trials, the rise of its modern worldview, political consciousness and social activity, a sense of belonging to the events around us, an environment of mutual affection and harmony in our society"[1].

Indeed, in the conditions of today's globalization, factors such as universal democratic principles of interethnic harmony, interethnic harmony, mutual cooperation, interreligious tolerance play an important role in ensuring the peaceful life of our people, strengthening independence, constant sympathy and awareness in the current conditions of increasing risk of terrorism, extremism and radicalism.

All the reforms carried out in Uzbekistan, including socio-political and spiritual ones, in essence, imply the orientation of social relations to human interests, the formation of high spiritual and moral qualities in it. Humanity, as a universal democratic principle and a high spiritual value, brings humanistic traditions, views and norms into the socio-political processes, the management of the state and society. In this way, it enriches the socio-political sphere with humanistic values and acts as an important structure for the perception of the national self.

The rule of law is a socio-political and legal value – norm that applies to all in a democratic legal state. Laws passed by Parliament do not directly interfere with spiritual affairs, but without their participation, without influence, it is impossible to spiritually renew society. The most important thing is that the laws passed by the national parliament serve

to carry out large-scale reforms in our country, to form market relations, as well as to make decisions on socio-moral, spiritual values, such as peace, stability, harmony. As the first president of our republic, Islam Karimov, noted, "the peace, stability and solidarity of citizens decided in our country became the main guarantee for the success of fundamental reforms in the economic-political and spiritual life of our republic. These results are, above all, closely related to changes in our worldview. Selfless, hardworking, our people strive for independence and the great prospect of our country, realizing that the value of the homeland is the honor of the nation, are happy with their talent, all their opportunity, all their strength to the prospect of country"[2].

Indeed, the transformation of the rule of law into all valid socio-political and legal values encourages the implementation of multiple tasks, the elimination of many objective and subjective barriers. Today, however, the concept of "rule of law" in the spirituality of our society cannot be denied that a value has been formed. This was stated by our President Sh.Mirziyoev noted, - "in our Constitutions and laws, regardless of nationality, language and religion, it is guaranteed that all our citizens have equal rights and freedoms. They have been given every opportunity to preserve their national culture, traditions and Customs, to develop in every possible way"[3].

There is no state, society, man who does not strive for social justice. A certain socio-political ideas, views formed during the Aces, later became a value that people adore in their minds, hearts.

The spiritual renewal of society, the changes that have occurred in the minds and imagination of people have always been associated with the decision-making of social justice. Special studies show that where justice is established, when the management of the affairs of the state and society is carried out in accordance with the principle of justice, equality and spiritual and moral standards are decided in the same place. Therefore, social justice has a great role in the spiritual renewal of society, it is impossible to form pure human, spiritual and moral relations, values in society without making a decision.

In the national consciousness of each people there are fundamental aspects that are unique and appropriate to this people, historically formed, that represent the psyche, mentality, character, uniqueness of this people, and they leave their mark on the social system of the country.

Democracy in world development as a universal value is a style of management that is embedded, recognized and correspondingly embedded in the thinking and lifestyle of different peoples, nations. At the moment, the second side of this law is associated with the existence of the way of life, mentality of each people, the feature of feeling, understanding, understanding and following democracy. Democracy, no matter how universal democratic principles acquire universal meaning and value, is the basis of it, "nationalism", "national psyche", "national identity", which gives it spiritual strength, enriches it, ensures its colorfulness. Democracy remains at odds with its essence if it does not take into account nationalism, the perception of the national self, the national psyche, and rely on it. For this reason, universal democratic principles are also an important structure for the understanding of the national identity.

In the understanding of the national identity of peoples, interethnic harmony and religious tolerance occupy an important place in an important link of universal democratic principles, along with national identity. Instructive work is being carried out in Uzbekistan on the implementation of interethnic harmony and religious tolerance. This was stated by our President Sh. Mirziyoev said, "even in the fifth priority of the strategy of action we carry out today, the most important tasks for ensuring interethnic harmony and religious tolerance are outlined.

138 national cultural centers play a big role in developing ethnic identity and further harmonizing interethnic relations in our country" [3].

The new thinking that is taking shape in Uzbekistan today serves to deepen the relations of different nations. The concept of tolerance of the first president of our republic, Islam Karimov, came into the world as the idea, theoretical and practical basis of this new thought, and it is consistent with universal democratic principles. A holistic culture of Uzbekistan is being formed on the basis of the fact that any nation will restore its national values, improve its living traditions and traditions, color of cultures, diversity of peat.

The current socio – political processes, evolution of interethnic relations, stages of evolutionary development indicate that a holistic national-spiritual environment is being formed in Uzbekistan, every citizen, regardless of nationality and nationality, is interested in this environment. And the sense of self-interest is enriching its content through mutual respect, High spirituality, maturity and striving for perfection.

As our President Shavkat Mirziyoev noted in his speech at the meeting on the 25th anniversary of the establishment of the Republican Center for international culture, "it is known that representatives of different nationalities, cultures and religions have lived peacefully on our ancient and generous land for many centuries. Hospitality, goodness, generosity of the heart and literal tolerance have always been characteristic of our people and form the basis of its mentality"[4].

Almost all countries of the world are multinational. The fact that our republic is one of such rich, cultivated and prosperous countries gives pride to every Uzbek country. Addressing this issue, Islam Karimov stated that "such national diversity and, at the same time, a sense of unity inherent in a single

people is not only a unique feature, but also a huge value for each of us that cannot be measured and assessed by anything its life – giving effect and its importance in mutually enriching all of us"[5].

The activities of the Republican Center for International Culture (RCIC) and the national cultural centers (NCC) are aimed at reviving the national traditions, customs and rituals of the peoples living here, developing spirituality and culture, harmonizing interethnic relations. With the initiatives of the president of the Republic Shavkat Mirziyoev, a committee on interethnic relations and friendly relations with foreign countries was established on the basis of the International Center of the Republic in order to take the activities of these centers to a new level, to further develop cultural friendship with foreign countries. In the activities of national – cultural centers, special attention is paid to the study, preservation of folk creativity, as well as the promotion of professional art samples. Evidence of this can be seen in the activities of choral communities and instrumental orchestras such as the Kazakhs "Koktem", the Armenian "Khuravats – shou", the Russian "Gryadushie", the German "Yugenshtern", the Meskheti Turkish "Miko" Theatre – studios, the Polish "Plyast", the Belorussian "Katyusha", the yaxudi "Shalom".

Indeed, on the Land of Uzbekistan from ancient times, religions with a complex ideological system, such as Islam and, before that, Zoroastrianism, Buddhism, Judaism, Christianity, functioned in harmony. Even after the introduction of Islam into our country, Uzbekistan continued to be a center of peaceful coexistence, with a wide variety of religions and cultures.

In fact, as our President Shavkat Mirziyoev noted, "today, representatives of more than 130 nationalities and nationalities live in our country as stable and cowardly as children of the same family. They unite on the path of prosperity of our common home – Uzbekistan, work selflessly in all spheres and sectors, make a worthy contribution to the construction of a legal democratic state based on a developed market economy and a strong civil society[4]".

Based on the analysis of the above points, the following conclusions can be drawn: firstly, the construction of a democratic society creates the necessary conditions for the realization of a national idea and a national identity; secondly, the experience of Uzbekistan confirms that it is possible to build a democratic, secular, civil society even taking into account the national values, traditions of the people.

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Signed in print: 30.03.2023. Size 60x84 1/8

«Theoretical & Applied Science» (USA, Sweden, KZ)
Scientific publication, p.sh. 25.0. Edition of 90 copies.
http://T-Science.org E-mail: **T-Science@mail.ru**

Printed «Theoretical & Applied Science»