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Postal address:
1. In Cyprus:
8046 Atalanta court, 302
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2. In Russia:
13 Shpalernaya St,
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UDK 630

Conditions for the Choice of Forest Machines in Construction of Linear Objects

M.V. Ivashnev, R.K. Kalinin, A.S. Vasilyev, Yu. V. Sukhanov

Petrozavodsk State University, Petrozavodsk (Russia)

Key words and phrases: forest machine; natural conditions; production conditions; linear object.

Abstract. The goal is to analyze the influence of natural and industrial conditions on the operation of forest machines during the construction and operation of linear objects. Tasks – to determine the main factors affecting the natural and production conditions for the use of forest machines. In the course of the work done, the main factors influencing the choice of technology for the operation of forest machines during the construction and maintenance of linear objects were identified.

The construction of linear objects requires preliminary work such as clearing the area from trees and shrubs growing on it, removing stumps, fallen trees, boulders, etc. In the future, when servicing previously built linear objects, the clearings and right-of-way on which they are located, at certain intervals, must be cleared of trees and shrubs that have grown on them. For these works, specialized machines and equipment are used: harvesters, brush cutters, stone pickers, uprooters, collectors, ditchers, rippers, planners, etc.

At the same time, the efficiency of machines in the forest depends on both natural and production conditions. Forest areas occupy almost half of the territory of our country. The natural conditions in which forest machines operate are characterized by great diversity and are determined by soil and ground conditions, terrain, and climatic conditions. Their possible combinations are even more diverse.

There are various technological schemes for carrying out the same type of work [1]. The terrain relief plays a decisive role in choosing the application of one or another technological scheme. When choosing machines for the implementation of the desired technology, they are primarily guided by soil and ground conditions. The specific ground pressure of caterpillar skidders is in the range of 0.3–0.6 kgf/cm², and that of wheeled skidders is 1.7–2.1 kgf/cm², i.e., 3.5–7 times more [2]. Research and logging practice show that it is difficult to master the entire forest fund with wheeled vehicles, since they do not have sufficient maneuverability on soils with low bearing capacity and, if necessary, overcome various kinds of obstacles in the form of large stumps, boulders, deadwood, etc. [3].

Depending on the climatic conditions, the types of climatic modification of the machines are installed. Forest areas in our country are located in two climatic zones – with a temperate climate (**U**) and a cold climate (**UHL**). In the zone with a temperate climate, the average of the annual absolute maxima of air temperature is equal to or below –40 °C, and the average of the

annual absolute minimums is equal to or below – “minus” 45 °C [4].

The production conditions for the operation of machines used in the maintenance of linear objects should include technical, organizational measures, as well as the operating conditions of the machines.

Technical measures include actions that affect the state of the systems and components of the machines used, actions aimed at maintaining the machines in working condition, as well as the availability of special tools and equipment required when performing maintenance, current and overhaul repairs, compliance with deadlines and regulations maintenance and repair work.

Organizational measures include factors that contribute to the normal operation of machines within the framework of the ongoing technological process, including: the class of the machine, the level of training of the machine operator, his work experience, the qualifications of the personnel servicing the machine, etc.

Technical and organizational measures are closely interconnected and are integral parts that complement each other.

The operating conditions of the machines are determined by such characteristics as: productivity, efficiency of work, stability from overturning, cross-country ability, reliability, maneuverability, ease of control, environmental friendliness, as well as the organization of the operation of machines, which is characterized by: speed of movement, movement pattern, duration of the cycle of work taking into account time spent on the performance of working and idle phases, the characteristics of the object of labor processed by the machine.

Therefore, in the process of construction and operation of linear objects, the choice of appropriate machines should be made on the basis of solving optimization problems, as well as modeling problems [5]. At the same time, simulation modeling is an effective tool for predicting complex systems, which can be used both as an independent tool and in conjunction with other tools [6]. The use of these tools is associated with the need to take into account the influence of numerous factors, taking into account both natural and production conditions, the characteristics and availability of mass-produced equipment, ensuring high productivity with minimal manual labor, energy and the ability to perform the production process with the formation of a minimum amount of waste and environmental damage. environment.

If natural factors are more or less stable over time, then production factors, taking into account scientific and technological progress leading to the development of technology and technological processes [7], require constant refinement of the values of the significant coefficients included in the simulation formulas, ranking factors according to their significance, especially factors characterizing new designs of machines and parameters of new technological processes using innovative technical solutions.

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Условия выбора лесных машин при строительстве и эксплуатации линейных объектов

М.В. Ивашнев, Р.К. Калинин, Ю.В. Суханов, А.С. Васильев

*ФГБОУ ВО «Петрозаводский государственный университет»,
г. Петрозаводск (Россия)*

Ключевые слова и фразы: лесная машина; линейный объект; природные условия; производственные условия.

Аннотация. Цель работы – выполнить анализ влияния природных и производственных условий на работу лесных машин при строительстве и в процессе эксплуатации линейных объектов. Задачи: определить основные факторы, влияющие на природные и производственные условия применения лесных машин. В ходе проделанной работы определены основные факторы, влияющие на выбор технологии эксплуатации лесных машин при строительстве и обслуживании линейных объектов.

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Improving the Quality of Educational Activities through Qualimetric Assessment of Knowledge

V.A. Matyash, V.L. Olenev, E.A. Frolova

St. Petersburg State University of Aerospace Instrumentation, St. Petersburg (Russia)

Key words and phrases: SUAI; knowledge assessment; knowledge evaluation; project work.

Abstract. In the paper, the authors share an effective approach to the evaluation of students' knowledge. The motivation for the development of this approach was to clarify individual students' performance during the semester and prove the objectivity of the final grade on the subject. The authors provide a detailed description on how to split the 100 points between the semester tasks. The detailed description of each subtask and the diagrams for the points' calculation is also provided. The developed approach makes the process of the knowledge evaluation transparent and easy to use for both students and instructors. The assessment system motivates the students to work intensively throughout the semester, to follow the lectures and not to miss the information that they would need for the final exam. As a result, this approach shows the real level of the students' competences. This greatly improves the education quality for each of the courses, where such approach is implemented.

Introduction

Several years ago, a new course "Systems Modeling" was implemented at St. Petersburg State University of Aerospace Instrumentation (**SUAI**). The course consisted of several lectures, six practical assignments, and a list of exam questions. The organization of the course looked very old and inefficient. Students were not learning the material and could not concentrate on the lectures; the material itself was uninteresting and irrelevant. Students were just copying practice assignments with little changes and trying to pass the practice, but they did not understand what they were doing, why they were doing it, or how it had to be done. Also, sometimes during the exam, students would ask an instructor to explain why they got a particular grade. They would say that they were doing a good job, but at the exam they were just worried and wanted to get a higher grade. It became clear that the final exam grade did not take into account students' progress during the semester. Eventually, the decision was made to change the entire course, namely:

- to update the content for the lectures;

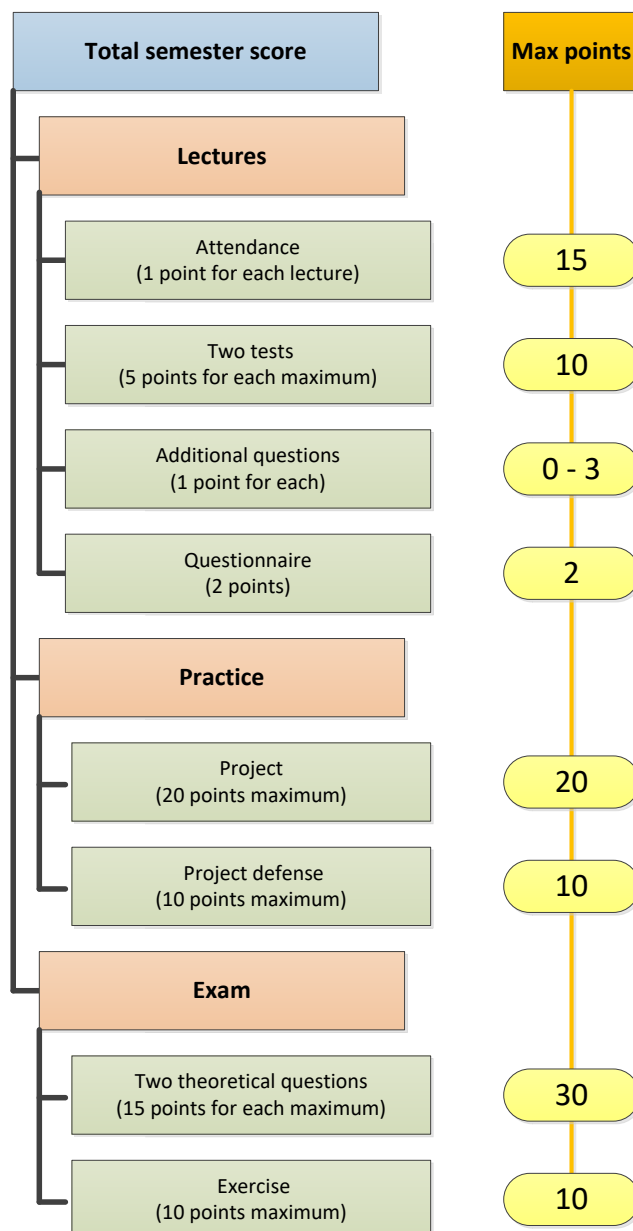


Fig. 1 Distribution of points for one full semester

- to change the practical assignments;
- to introduce new learning assessment system;
- to get the feedback from students and make the course better from year to year.

Therefore, this paper focused on the knowledge assessment system. A review of already existing methods did not yield an approach that could be applied to the course. There are many automatic knowledge assessment systems [1–3]. Assessment of learning outcomes is one of the CDIO educational standards [4], which states that the instructor needs effective processes for assessing knowledge. Different categories of learning outcomes require different assessment methods. Therefore, there are a number of publications related to this topic in the context of CDIO. For example, a description of the informal assessment method is given in [5], and some other methods are presented in the literature from [6]. However, these are just concepts, and

they are informal. Therefore, based on different methods, information about which was in the literature, a new approach was introduced, tested and verified for 7 years. We can now say that it is effective and yields good results. It can be useful for others because everything is formal and can easily be applied to other courses with fewer changes.

Learning assessment is very important and useful thing for measuring students' acquisition of the learning materials and grading their progress at the end of the semester. SUAI decided to change the old 4-grade system (2, 3, 4, 5), which is typical for Russia, and chose the 100-points system [7]. Each teacher can decide how to distribute these points between the different aspects of a subject throughout the semester. However, most of teachers still use these points just for the final exam. Finally, at the end of a semester student gets the final grade according to the earned points:

- less than 45 points for the whole semester is “did not pass”;
- 46–60 points means “passed”;
- 61–80 points means “well passed”;
- more than 81 points equals to “excellent”.

This system was taken as the basis. The overall number of points consists of 3 major parts: Lectures, Practice, and Exam.

Fig. 1 shows the diagram of the distribution of points for one full semester. The right part of the figure shows the maximum points that student can earn for each assignment.

Lectures

During lectures, the instructor gives presentations and sometimes discusses interesting examples with the students. In each lecture, a certain amount of time is allotted for students' questions, and if there is a chance that they have not understood the material, key slides are repeated. The practicum is held in a special laboratory where students have access to computers. During the practice students do a team project. The final exam is an oral exam with a practical session.

Lecture attendance scores student 1 point for each lecture. Therefore, in general he can get 15 points for the semester. 15 points is a big part of the total semester score and almost the half of the points that are needed to be allowed to take an exam. This is needed not only to monitor attendance, but it gives me a chance to get the students interested in the course, especially those students, who are not motivated enough.

At the end of the lecture, a short quiz is offered with several questions related to the current lecture. So in addition to that, students can get points for answering these questions. 1 point for each correct answer – this encourages students to concentrate, take notes, and ask questions. It also motivates them to stay in class until the end of the lecture.

To monitor the learning outcomes, two tests have been added, which students take during mid-semester lectures. They can get a maximum of 5 points for each test. Each test consists of 5 small problems. The number of problems a student solves is the number of points he or she receives. The test is passed if the student solved more than two problems. Each student may rewrite the test only once – during the pre-exam week.

In the middle of the semester, students fill out a special questionnaire regarding the lecture course. The questionnaire includes questions about whether they like what they are learning, whether it is understandable, what information they expected to learn in the course, etc. The questionnaire is anonymous. The instructor receives a list of the students who completed the questionnaire. Thus, the questionnaire is not tied to the student's identity. All those students

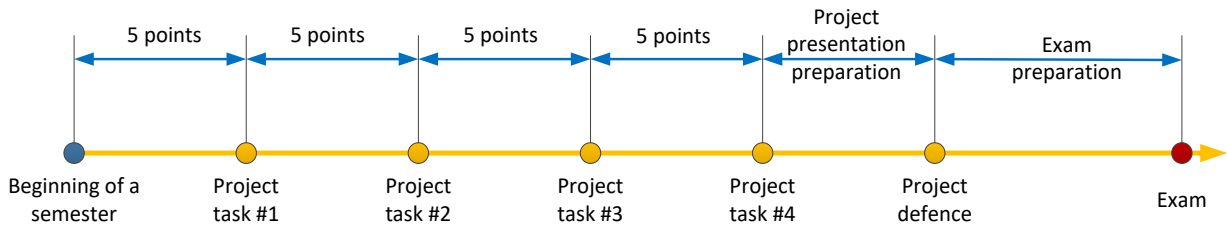


Fig. 2. Project points distribution

get an extra 2 points – it encourages them to give important feedback. It really works, and helps to find different aspects that can improve the course.

Practice

For the practical part, it was decided that individual assignments, slightly related to each other are not interesting enough. Instead, students have to work on a project during the semester. They work in groups of 3–4 people; one of the students becomes the project leader, who is responsible for this work. Students choose a team, a leader, the main title of the project in Simulation (the system they want to simulate). The project itself consists of four main parts, each of which must be completed in a certain amount of time. If students do not complete the assignment by the required date, being late for each week deducts one point from the project grade.

When the project work is finished, students prepare the presentation for the project defence. They can get maximum of 10 points for the presentation. At the project defence, technical details are no longer discussed (except the obvious mistakes); the key focus is presentation itself, quality of the material and speech. The teacher assigns the speakers from each team randomly, so students cannot know which piece of the presentation they will be telling. Therefore, they must help and train each other to defend so that no one will let them down. After the presentation, the project manager fills out a questionnaire, in which he assesses the effectiveness of the team, states who participated in the work and who did not. Based on this, teacher can lower the project score for lazy students.

The detailed project points' distribution is depicted at Fig. 2.

Examination

40 points are left for the exam, which consists of two theoretical questions (15 points for each) and one practical exercise – 10 points.

If a student successfully passes two tests, finishes the project, and scores more than 40 points – he can take the final examination. These 40 points is the total score for the lectures and practice. If at least one of the tests is not passed (less than 3 points), student cannot get more than “passed” mark for the exam. If they have 5 points for both tests – they should not solve the practical exercise during the exam and they get 10 points for it automatically. If the project is not finished – they are not allowed to take the exam.

If a student perfectly passes all the steps during the whole semester, he/she has around 100 points.

This is a detailed description of the system. It is not very complicated, but it looks complicated

to students at the beginning of the course. In the first lecture a lot of time is spent describing the system. Diagrams and an example are used – this helps them adapt and feel comfortable later on.

Conclusion

Now we take a look at how this new assessment system has affected the effectiveness of teaching. Lecture attendance is about 90 %, which is a very good indicator. Students admit that they are interested in the lectures and the topics, and they feel involved in the process. Most students listen, answer questions, and participate in discussions.

The practical part brought them a whole new experience. It is a group project work where students interact, learn and help each other. They have begun to read additional literature to make the projects more impressive. Students use their own experiences and imagination to form assignments and describe complex systems and models.

Students can now decide what points to get and how many will be enough for them. Sometimes they get a large number of points and decide to answer only one question on an exam, and that is enough for them to get an “excellent” grade. If students are working – they can’t participate in lectures, but they can score points using other assignments.

All of this has yielded excellent results. In the last 7 years, there hasn’t been a single student who hasn’t taken the course. In addition, it is really evident that the level of knowledge in the subject has become much better.

This approach can be useful to other teachers as well. It can easily be transformed and applied to other courses, not just technical ones.

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**Повышение качества образовательной деятельности
на основе квалиметрической оценки знаний**

В.А. Матьяш, В.Л. Оленев, Е.А. Фролова

*ФГАОУ ВО «Санкт-Петербургский государственный университет
аэрокосмического приборостроения», г. Санкт-Петербурге (Россия)*

Ключевые слова и фразы: Государственный университет аэрокосмического приборостроения; оценка знаний; оценка обучения; проектная работа.

Аннотация. В данной статье авторы описывают эффективный подход к оценке знаний студентов. Целью разработки такого подхода была необходимость точной оценки индивидуальных результатов студентов в течение семестра и доказательство объективности итоговой оценки по предмету. Авторы подробно описывают, как распределить 100 баллов между заданиями и активностями, которые распределены по семестру. Также предоставлено подробное описание каждой подзадачи и приведен пример диаграммы для подсчета баллов. Разработанный подход делает процесс проверки знаний максимально прозрачным и удобным как для студентов, так и для преподавателя. Система оценивания мотивирует студентов интенсивно работать в течение семестра, следить за лекциями и не пропускать информацию, которая понадобится им для экзамена. В результате такой подход показывает реальный уровень компетенций студентов. Это значительно повышает качество обучения по каждому из курсов, где реализован такой подход.

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Assessment of the Impact of Costs on the Profit Optimization Model for the Sale of Services

E.K. Chepurnova, I.K. Andrianov

*Komsomolsk-on-Amur State University,
Komsomolsk-on-Amur (Russia)*

Key words and phrases: numerical method; profit; sales optimization; service sector.

Abstract. The study carried out mathematical modeling of the profit optimization process when selling services with restrictions on the cost of services, the number of services sold. The goal of the study was to construct a profit optimization target function based on the service sales history. The objectives of the study included the determination of optimization parameters, the development of numerical calculation methods, as well as conducting a numerical experiment to assess the impact of expenses on the optimal value of profit. The hypothesis of the study is to establish mathematical regularities between the main parameters of the financial process for the sale of services with the possibility of maximizing profits under restrictions on the cost and quantity of services. The research method was mathematical modeling, numerical solution of the nonlinear problem of finding the optimal solution using the Newton-Raphson method. An iterative scheme for calculating the optimal number of services sold is constructed. According to the results of the study, the proposed model will allow us to establish a functional pattern between the target function of profit and the cost of sales. The proposed model and numerical calculation methodology are of practical importance in order to increase financial income in the service sector. Within the framework of a numerical experiment, an assessment of the impact of costs relative to the critical cost of a service, at which there is no demand, on the change in the optimal values of the profit objective function and optimization parameters: the cost of a unit of service and the number of services sold.

In the conditions of modern business development, economic processes, and especially the service sector, the issue of optimal choice of prices for services rendered, in particular, educational, advisory, etc., is relevant [1–4]. Today, service sellers often face a choice: how to

determine the optimal cost of the service provided. Too low the cost of the service can attract a large number of buyers, which the seller is not able to serve for a fixed period of time, and vice versa, too high – can alienate potential buyers and reduce the possible income of the seller. In most cases, the seller focuses on the average market value, but the high or low quality of the service provided can affect demand. Thus, the purpose of this work was to build a profit optimization model with varying values of the cost of the service and the number of services sold.

As an objective function, consider the profit R from the sale of services, the optimization variables will be p is the cost of a unit of service, Q is the number of services sold. In this case, the dependence of the cost of the service and demand can be described by a decreasing exponential function: $p = p_0 a^{-Q}$, where the unknown p_0, a are determined from the sales history. If there is data on the demand of m buyers at the cost of the service p_m and the demand of l buyers at the cost of the service p_l , then the constants a, p_0 can be determined from the conditions:

$$\left. \begin{aligned} p_m &= p_0 a^{-m} \\ p_l &= p_0 a^{-l} \end{aligned} \right\} \quad (1)$$

Solving the system (1), we obtain the values of the required constants:

$$a = \left(\frac{p_m}{p_l} \right)^{\frac{1}{l-m}}, \quad p_0 = p_m \left(\frac{p_m}{p_l} \right)^{\frac{m}{l-m}}.$$

At the same time, p_0 characterizes the critical cost at which zero demand for the service begins. Then the statement of the profit optimization problem will take the form of a conditional optimization problem with restrictions of the form of equalities and inequalities:

$$\left. \begin{aligned} R &= (p - z)Q - P \rightarrow \max \\ p - p_0 a^{-Q} &= 0 \\ z - kp_0 &= 0 \\ Q - \bar{Q} &\leq 0 \end{aligned} \right\} \quad (2)$$

where z is the cost of implementing the service, P is other expenses, $0 < k < 1$ is the share of expenses z of the critical cost p_0 , \bar{Q} is the upper bound of Q .

Resolving the system (2), we proceed to the objective function:

$$R = p_0 (a^{-Q} - k)Q - P. \quad (3)$$

Using the extremum condition for (3): $\partial R / \partial Q = 0$, we proceed to the equation

$$k + a^{-Q} (Q \ln a - 1) = 0. \quad (4)$$

Due to the nonlinearity, equation (4) has no analytical solution, so we apply the Newton-

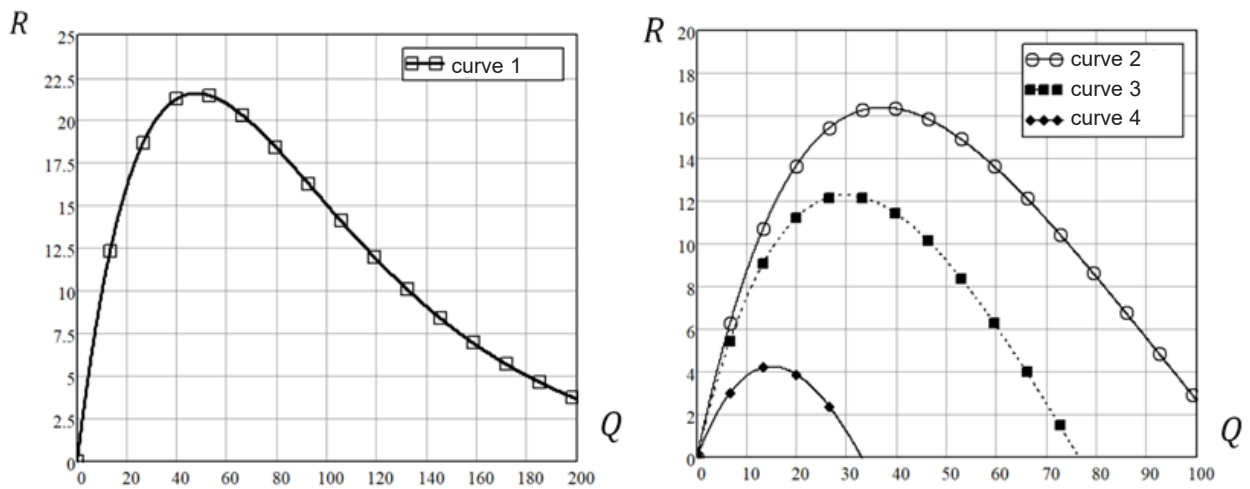


Fig. 1. Dependence of profit on the number of services sold:
 1 – $z = 0$, 2 – $z = 0.1p_0$, 3 – $z = 0.2p_0$, 4 – $z = 0.5p_0$

Table 1. Results of profit optimization when selling services

№	Expenses, $z/p_0 \cdot 100\%$	Estimated number of services, Q	Maximum profit, R^*	Optimal number of services, Q^*	The optimal cost of the service, p^*
1	0	50.49	23	50	0.46
2	10%	39.47	17.5	39	0.57
3	20%	31.61	13.1	32	0.66
4	50%	15.9	4.53	16	0.9

Raphson method for numerical solution by iteration:

$$Q^{(j+1)} = Q^{(j)} + \gamma \frac{k + a^{-Q^{(j)}} (Q^{(j)} \ln a - 1)}{p_0 a^{-Q^{(j)}} (\ln a - 2) \ln a}, \tag{5}$$

where j is iteration number, $-1 < \gamma < 0$ is the coefficient to ensure the convergence of the iterative process according to the condition:

$$\left| 1 + \gamma p_0 a^{-Q^{(j)}} (\ln a - 2) \ln a \right| < 1.$$

Criterion for stopping the iterative process:

$$\left| \frac{Q^{(j+1)} - Q^{(j)}}{Q^{(j)}} \right| < \varepsilon,$$

where ε is calculation accuracy. To ensure the maximum condition of the profit function: $\partial^2 R / \partial Q^2 = 0$, condition verification required: $Q < 2 / \ln a$.



Fig. 2. Dependence of the cost of service p on the number of services sold Q based on the sales history

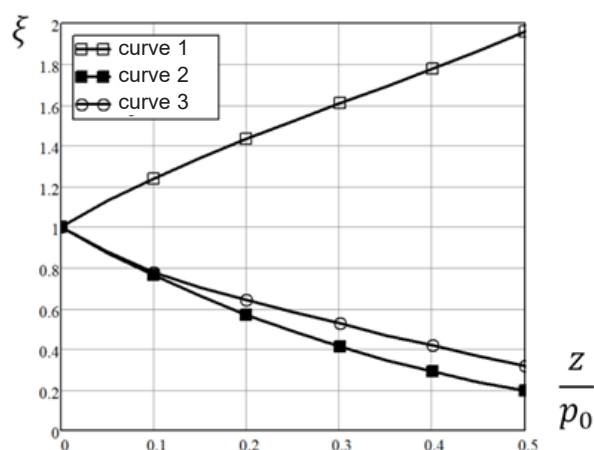


Fig. 3. The dependence of the relative results of optimization on the relative costs of implementing the service:
 $1 - p^*/(p^*|_{z=0})$, $2 - R^*/(R^*|_{z=0})$, $3 - Q^*/(Q^*|_{z=0})$

We consider the application of the numerical model (5) to the assessment of the impact of expenses on profit maximization. Assume that the demand at the cost of $p = 1$ made up $Q = 10$ services sold, and when the cost is reduced by 10 %, i.e. when $p = 0.9$ demand increased by 50 %, i.e. $Q = 15$. Then the critical cost at which zero demand begins: $p_0 = 1.24$, a the basis of the cost function $a = 1.02$. Consider the impact of expenses on the change in the profit function for cases when the costs of selling a unit of service: missing ($z = 0$), make up 10 % of p_0 ($z = 0.1p_0$), 20 % of p_0 ($z = 0.2p_0$), 50 % of p_0 ($z = 0.5p_0$). The calculation results are presented in table 1 and in Fig. 1–3 when $P = 0$, $\bar{Q} = 110$ and $2/\ln a = 101$.

Fig. 1 shows that the profit function reaches its maximum when the number of services sold changes. With increasing costs, the maximum R decreases. Since $Q \in N$, the optimal values of R^* are compared when rounding Q to the nearest integer values (Table 1).

Since it is not the quantitative characteristics of optimal values that are important for us: profit, unit price, quantity of services – but their changes depending on changes in costs, we will introduce a vector of results:

$$\xi \left\{ \frac{p^*}{p^*|_{z=0}}; \frac{R^*}{R^*|_{z=0}}; \frac{Q^*}{Q^*|_{z=0}} \right\},$$

where $p^*|_{z=0}$, $R^*|_{z=0}$, $Q^*|_{z=0}$ are optimal values: the cost of the service, profit, number of services – at zero costs. According to the results obtained (Fig. 3) with an increase in the cost of selling the service within 50 % of p_0 , the optimal cost of the service increases almost 2 times, the optimal values of profit and the number of services sold decrease by more than 70 % at $z = 0.5p_0$.

Thus, according to the results of the study, the proposed profit optimization model makes it possible to evaluate not only the optimal combinations of the number of services sold and the cost of a unit of service under specified restrictions, but also to assess the impact of costs on changes in profit indicators. The results of this scientific work may be of great practical importance for effective sales in the service sector.

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Оценка влияния затрат на оптимизационную модель прибыли при продаже услуг

Е.К. Чепурнова, И.К. Андрианов

*ФГБОУ ВО «Комсомольский-на-Амуре государственный университет»,
г. Комсомольск-на-Амуре (Россия)*

Ключевые слова и фразы: оптимизация продаж; прибыль; сфера услуг; численный метод.

Аннотация. В исследовании проведено математическое моделирование процесса оптимизации прибыли при продаже услуг с ограничениями на стоимость услуги, количество продаваемых услуг. Цель исследования заключалась в построении целевой функции оптимизации прибыли на основании предыстории продаж услуг. Задачи исследования включали в себя определение параметров оптимизации, разработку численной методики расчета, а также проведение численного эксперимента по оценке влияния расходов на оптимальное значение прибыли. Гипотезой исследования является установление математических закономерностей между основными параметрами финансового процесса по продаже услуг с возможностью максимизации прибыли при ограничениях на стоимость и количество услуг. Методом исследования являлось математическое моделирование, численное решение нелинейной задачи поиска оптимального решения с помощью метода Ньютона-Рафсона. Построена итерационная схема расчета оптимального количества продаваемых услуг. Согласно полученным результатам исследования предложенная модель позволит установить функциональную закономерность между целевой функцией прибыли и затратами на реализацию продаж. Предложенные модель и численная методика расчета имеют практическую значимость с целью повышения финансового дохода в сфере услуг. В рамках численного эксперимента проведена оценка влияния затрат относительно критической стоимости услуги, при которой отсутствует спрос, на изменение оптимальных значений целевой функции прибыли и параметров оптимизации: стоимости единицы услуги и количества проданных услуг.

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UDK 338

The “New Era” in China-Russia Partnership

M.M. Melnikova, D.R. Goryachev, M.R. Khaliman

*Far Eastern Federal University,
Vladivostok (Russia)*

Key words and phrases: China-Russia relationship; “New Era” in China-Russia relationship; international relationship; international economy.

Abstract. The object of research is China-Russia partnership, and the subject is the “New Era” of China-Russia relationship. This article analyzes the main values which provide the basis of modern manifestation of China-Russia relations. In this regard the results of the EEF 2022 (Eastern Economic Forum) are considered and it proved the hypothesis of economic and political ties between the two states strengthening and economic climate becomes warmer.

Since 2014 the relationship between Russia and China has evolved into a pragmatic strategic partnership, which represents a new stage of development on the global stage. Despite some skepticism connected with Chinese ‘Belt and Road’ initiative considered not beneficial for Russia and economic misbalance between the two countries, these states still have compelling reasons to strengthen their partnership.

It is widely admitted by scholars that the humanity has entered a new era of development and profound transformation in such spheres as multipolarity, economic globalization, the advent of information society, cultural diversity, transformation of the global governance architecture and world order. Responding to these current trends, President of the People’s Republic of China Xi Jinping and President of the Russian Federation Vladimir V. Putin held talks in Beijing on 4 February 2022. As President Xi and President Putin reached many consensuses on expanding all-round practical cooperation this talk marked the “New Era” in China-Russia relations based on the following values:

1) sharing the understanding that democracy is a universal human value, and it should be exercised in all spheres of public life and implemented at the global level, however, the advocacy of it should not be used to put pressure on other countries;

2) belief that peace, development and cooperation lie at the core of the modern international system, the intensification in practical cooperation in various areas and interconnectedness between of the international community in creating open, equal, fair and non-discriminatory conditions for development;

3) providing concern about international security challenges and believe that fates of all nations are interconnected.

The Eastern Economic Forum is the main international platform for establishing and strengthening ties within the Russian and global investment communities, and for comprehensive expert evaluation of the economic potential of the Russian Far East, the investment opportunities

it offers, and business conditions within advanced special economic zones. Events at the Forum traditionally took place in the form of panel sessions, roundtables, televised debates, business breakfasts, and business dialogues devoted to Russia's relationships with various countries. The Forum business program includes a number of business dialogues with leading partner countries in the Asia-Pacific region, and with ASEAN, a key integration organization uniting dynamically developing nations in Southeast Asia.

China's trade and investment in the Russian Far East are significant and growing fast. This year Li Zhanshu, the current Chairman of the Standing Committee of the National People's Congress attended the plenary session of the 7th Eastern Economic forum and delivered a speech titled "Advance the Process of World Multipolarization and Open a New Chapter in Regional Cooperation". Li noted that the theme of this year's EEF "On the Path to a Multipolar World" is right in time, adding that a multipolar world is the trend of history and the common expectation of the international community. Li recalled that at the invitation of President Putin, Chinese President Xi Jinping participated in the EEF twice and delivered important speeches, expounding on China's proposals and initiatives on developing China-Russia relations, promoting mutually beneficial regional cooperation, and maintaining regional peace and stability, which elicited warm response from the international community.

In his speech he mentioned the Global Development and Global Security initiatives, injecting stability and positive energy into the world and contributing Chinese wisdom and solutions to solving problems of the times, which were put forward by President Xi and received support from international organizations, including the United Nations and from many countries, including Russia and expressed intention of China further strengthen all-round cooperation with Russia. He pointed out that China will continue to support and participate in the development of Russia's Far East, advance the deep docking between the full revitalization of Northeast China and Russia's Far East development national strategy, and promote fruitful cooperation between the two countries in the Far East. The top Chinese legislator put forward a three-point proposal.

1. The GSI should be implemented to maintain regional peace and stability to build a harmonious and peaceful common home. All parties should uphold the vision of common, comprehensive, cooperative and sustainable security, pursue dialogue, seek partnership, work for unity, adhere to the principle of the indivisibility of security, and inject positive energy into regional peace and stability.

2. The GDI needs to be carried out to promote regional openness and integration. Efforts should be taken to boost partnerships, pool resources and platforms for cooperation, strengthen connectivity of development policies, tap the potential for innovative growth, maintain secure and unimpeded industrial and supply chains, and foster a more stable, secure and free trade and investment environment to inject new impetus into economic globalization.

3. Development strategies should be synergized to enhance China-Russia cooperation in the Far East. To this end, the legislatures of the two countries should step up coordination to provide legislative guarantee.

Vladimir Putin pointed out that over the past years Russia has implemented big plans for the development of transport infrastructure, railways and roads, seaports and pipelines. These timely decisions have made it possible for businesses to quickly rebuild logistics in today's conditions, and redirect cargo flows to those countries that are ready and willing to trade with Russia and prefer civilized and predictable business relations. Furthermore, one of the important agreements in frames of the forum was the agreement between State energy giants Gazprom (GAZP.MM) and China National Petroleum Corporation (CNPC) on the use Russian rubles and Chinese yuan to pay for Russian natural gas supplies to China.

New infrastructure objects are being jointly financed, with some now operational, such as the Amur River Bridge between Heihe and Blagoveshchensk. It became apparent during the discussions that both China and Russia view the Heihe-Blagoveshchensk border cities as a key strategic development hub. Sited opposite each other on opposing banks of the Amur River, Heihe is part of the Heilongjiang Free Trade Zone (which is divided up into three component parts, the others being Harbin and Suifenhe). Consequently, this twin-city cluster is poised to thrive. With a combined population of about 1.7 million, the two cities are connected by bridge, ferry, and cable-car, the latter of which will be operational from 2023. Residents are not required to pass through immigration controls to reach each other, while Chinese is being taught in Blagoveshchensk schools, and Russian in Heihe. In conclusion, the China-Russia economic partnership is evolving to more dynamic due to the compelling reasons to strengthen the relationship. Both sides make important partners in bilateral trade for each other. Furthermore, the results of the EEF 2022 became the justification of the ties strengthening.

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«Новая эра» китайско-российского партнерства

М.М. Мельникова, Д.Р. Горячев, М.Р. Халиман

*ФГАОУ ВО «Дальневосточный федеральный университет»,
г. Владивосток (Россия)*

Ключевые слова и фразы: международная экономика; международные отношения; «новая эра» российско-китайских отношений; отношения Китая и России.

Аннотация. Объектом исследования данной работы являются партнерские отношения России и Китая, а предметом – «новая эра» российско-китайских отношений. В данной статье проанализированы ценности, составляющие фундамент современного состояния отношений двух стран. В этом контексте были рассмотрены результаты Восточного экономического форума 2022 г. и была подтверждена гипотеза об укреплении экономических и политических связей между государствами.

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UDK 338

**The Afghan Crisis 2021:
The Negotiation Process after the US Troops Withdrawal**

P.R. Zainullina

*Far Eastern Federal University,
Vladivostok (Russia)*

Key words and phrases: Afghan crisis; Taliban takeover; American troops' withdrawal; Shanghai Cooperation Organization.

Abstract. The article focuses on the negotiations conducted after the Taliban takeover between their representatives with major powers and its neighboring countries not only in the format of bilateral talks, but in multilateral forums as well. The objective of this study is to analyze activities of global actors and regional players which were involved in stabilization of the situation in order to prevent the undesirable implications of seizure power by the Taliban in the analytical framework of the national interest. This research highlights that Afghan issue illustrates the lack of a unified global response, and stakeholders implement a particular foreign policy proceeding from their national interests.

After the US troops' withdrawal, the negotiating process between the Afghan government, the Taliban representatives and the stakeholders has been intensified. After the Taliban takeover, stakeholders primarily conducted negotiations with the Taliban representatives not only in the format of bilateral talks, but in multilateral forums as well.

Talks in the Moscow format meeting are of a paramount importance for regulating the situation in Afghanistan. On October 20, 2021, a meeting between the Russian side and Afghan leaders together with officials from India, Iran, Kazakhstan, Kyrgyzstan, China, Pakistan, Tajikistan, Turkmenistan and Uzbekistan without the participation of American government officials was held in Moscow to resolve the Afghan issue. A salient part of the negotiations focused on the economic situation in Afghanistan: after the Taliban came to power, an economic crisis broke out in the country, including that caused by the freezing of the state's financial assets in foreign banks. The parties acknowledged that the socio-economic and humanitarian situations in Afghanistan are deteriorating, and the international community must do everything to assist the population. The proposal to convene an international donor conference under the auspices of the UN in order to raise funds was made. At the same time, the main burden of financing the economic reconstruction and development of Afghanistan should be borne by the NATO countries, including the United States – as it was their military contingents that were present in this country over the past 20 years [6].

Moreover, the importance of the Shanghai Cooperation Organization, which celebrated

last year 20 years since its inception, is significant. The organization acts as a platform for discussing the “red lines” of the participating countries within the region, since it includes states that have serious political and territorial claims and that merely need to assemble and negotiate. In addition, the SCO can have leverage on the Taliban by suspending Afghanistan’s observer status in organization, restricting border traffic or denying recognition, investment and aid. The defeat of the United States in Afghanistan provides the SCO with an opportunity to play a crucial role in solving the growing security problem in the region and become one of the main platforms for negotiations [9]. However, despite the fact that all member states advocate for the formation of an inclusive government with the participation of representatives of all ethnic, religious and political groups of Afghan society, the situation is complicated because of the differences in the national interests of the SCO member states: some member states of the Organization advocate a complete refusal to cooperate with the current government of Afghanistan, while others, on the contrary, are willing to conduct negotiations with them and improve relations [8].

The future of security in the region is also determined by the interests and objectives of the leading regional players: Russia, China. Russia seeks to prevent the migration crisis, eliminate the terrorist threat to its borders and maintain its influence through the regional organizations, in which it fulfills the role of one of the main security providers. Military cooperation of the Central Asian countries with Russia is developing not only within the framework of the CSTO, but in a bilateral format, for instance, Uzbekistan expanded the agreement on military cooperation with Russia since April 2021 [1]. Regarding the seizure of power by the Taliban, by the time being, Russia is not ready to recognize them as the official power in Afghanistan. However, Russian president and top-level politicians are saying that Russia might consider removing the Taliban from the official list of terrorists, stressing the fact that this decision will depend on the development of the situation in Afghanistan and on recognition by the UN [10].

China is signaling that it might recognize the Taliban government in exchange for promises related mainly to ending support for terrorist groups operating in China’s border territories (Xinjiang region) [2]. Additionally, Chinese Foreign Minister Wang Yi called on the United States to lift sanctions on Afghanistan and pointed out the need for all parties to contact the Afghan Taliban in a pragmatic manner in order to help the state embark on the path of favorable development. In the military sphere, China also does not stand aside and the very next day after the Taliban seized Kabul, China and Tajikistan held joint military exercises. The US withdrawal allows Pekin to expand its influence in Afghanistan in order to exploit Afghanistan’s natural resources and use the territory as a critical location for the Belt and Road Initiative. In this regard, if China moves forward cautiously and supports the Taliban at these favorable conditions, there is a potential for China to create a useful loyalty in Afghanistan as a strategic asset [5]. Besides, Taliban takeover is a critical confirmation for China that western model of political system is not of a universal character. Therefore, China is interested in ensuring political stability in Afghanistan, since it is the stability that will guarantee the beneficial outcome from the implementation of Beijing’s economic aid to Kabul and would prove the Chinese superiority amid the western countries failure.

The Taliban itself recognizes the special role of Russia, China in strengthening peace in Afghanistan; therefore, it is going to establish contacts with representatives of these countries, to organize discussions on a number of issues related to political changes in the country. Therefore, Taliban has invited representatives of the above mentioned countries to the ceremony of the announcement of the new government.

In Central Asia, two approaches prevail regarding the talks with Taliban. Several states in

the region are trying to establish a connection with the Taliban at various levels. The Deputy Chairman of the Security Council of the Kyrgyz Republic Taalatbek Masadykov was the first among the leaders of countries of Central Asia, who held a meeting with the Taliban's representatives after the organization seized the power in Afghanistan. As a result of these negotiations, the Kyrgyz delegation delivered humanitarian aid on behalf of the people of Kyrgyzstan to the people of Afghanistan, which plays a vital role for Afghanistan in conditions when the humanitarian aid promised by the international community has not yet arrived, and the financial accounts of Afghanistan are still frozen [4].

The President of Uzbekistan Shavkat Mirziyoyev in September 21, in a UN address, said that Afghanistan should not remain in isolation, and announced the resumption of the supply of electricity and goods to this country [11]. Meanwhile, the president of Turkmenistan expressed their readiness to work closely with the new Afghan government and provide assistance to normalize the situation in this country. Besides, he expressed the hope that the transit of power in Afghanistan will be carried out peacefully on the basis of a broad national dialogue.

The head of Kazakhstan, Kassym-Jomart Tokayev, in his speech at a joint meeting of the heads of the CSTO and SCO member states, noted that Afghanistan may soon face an acute food crisis, which will inevitably spread to the countries of the Central Asian region and, in its consequences, will acquire a global scale due to the forced migration of the population. Therefore, the president believes, it is necessary to conduct an informal dialogue with the new authorities of Afghanistan, but their recognition cannot yet be discussed [7].

The opposite stance is represented by the Tajik authorities, who have criticized the Taliban government by demanding the protection of the interests of Afghan Tajiks, the second largest ethnic group in Afghanistan after the Pashtuns. Speaking at the summit of heads of state of the Collective Security Treaty Organization in September 16, Tajik President Emomali Rahmon emphasized the absence of political, ethnic diversity and gender equality in the new Taliban government. Dushanbe has openly expressed support for the resistance forces led by Ahmad Massoud, an ethnic Tajik son of Ahmad Shah Massoud and spoke out against the dialogue with the Taliban until it agrees to form a more ethnically representative government [3].

In conclusion, having common interest of ensuring regional security, the countries of the region and global actors most often take different stances on the Afghan issue. Regional and global powers construct their relations with Afghanistan on the basis of divergent initial data starting from ethnic and historical ties to the presence or absence of common borders, from varying economic interests to antagonisms among themselves. In addition, the Taliban's takeover of Kabul did not have a unifying effect on the five Central Asian countries.

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**Афганский кризис 2021 года:
Переговорный процесс после вывода американских войск**

П.П. Зайнуллина

*ФГАОУ ВО «Дальневосточный федеральный университет»,
г. Владивосток (Россия)*

Ключевые слова и фразы: Афганский кризис; вывод американских войск; захват власти талибами; Шанхайская организация сотрудничества.

Аннотация. Статья посвящена переговорам, которые велись после захвата власти талибами в Афганистане между их представителями с ведущими державами и соседними странами не только в формате двусторонних переговоров, но и на многосторонних форумах. Целью данного исследования является анализ деятельности глобальных акторов и региональных игроков, которые были вовлечены в стабилизацию ситуации с целью предотвращения нежелательных последствий захвата власти талибами в аналитических рамках концепта национальных интересов. Данное исследование подчеркивает, что афганская проблема иллюстрирует отсутствие единого глобального ответа, а заинтересованные стороны проводят определенную внешнюю политику исходя из своих национальных интересов.

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Features of Reconstruction of A.E. Rosen's House in Kurgan in the Time Frame of Historical Development

T.V. Salyaeva¹, V.V. Yachmeneva¹, N.M. Emelyanova²¹ *G.I. Nosov Magnitogorsk State Technical University, Magnitogorsk (Russia);*² *N.S. Alferov Ural State University of Architecture and Art, Yekaterinburg (Russia)*

Key words and phrases: time periods; historical heritage; reconstruction; architectural monuments; modern aspect.

Abstract. The purpose of the article is to trace the historical stages of the reconstruction of A.E. Rosen's house in Kurgan. To achieve this goal, the following tasks were identified: to consider the historical stages of the settlement of the house; to analyze the stages of the reconstruction of the house, to reveal the features of the reconstruction of the house of A.E. Rosen in Kurgan. The relevance of the study lies in the fact that in modern conditions of reconstruction of buildings with historical heritage, not enough attention is paid to its original appearance and layout. Sometimes, historical documents testifying to the construction of buildings do not give complete information about it, and in some cases they are simply lost. The preservation of historical heritage is one of the main tasks in the formation of the culture of our country and the upbringing of a spiritual and moral, harmoniously developed personality of modern youth.

In the ancient Russian city of Kurgan, there is the house of Andrei Evgenievich Rosen, which is currently an architectural monument. From historical sources stored in the local history museum of the city, it is known that it was built around the beginning of the 19th century. Until 1832, there were five identical estates with houses on the territory of A.E. Rosen's house. Over time, the territory began to belong to the district judge Alexander Grigorievich Ivanov, who was soon transferred to Tobolsk and the house was empty [1].

In 1832, after serving his sentence for participating in the uprising on December 14, 1825, Andrei Evgenievich Rosen arrived in the city of Kurgan. The family of A.E. Rosen settled in the former house of A.G. Ivanov. Since that year, a new life of this territory has begun. The first partial redevelopment of the building was associated with the birth of A.E. Rosen's son and daughter. At the same time, the main plan of the building was preserved. The building was partially rebuilt – it was extended deep into the site. In addition, three windows were made to the street. On the site there was a bathhouse, a barn and a stable. It is known that A.E. Rosen's



Fig. 1. House of the Decembrist Andrei Evgenievich Rosen

garden had a lot of ornamental and fruit trees, the varieties of which were bred by Andrei Evgenievich himself. It is known from historical sources that many townspeople turned to him for seeds. A.E. Rosen's family, having lived in this house for four years, left for the Caucasus in 1838 and the house was sold [1].

From this period, the second stage of restructuring and reconstruction of the building began, which secured the name of A.E. Rosen's house. Until 1867, many different families lived in the house of A.E. Rosen – Kipriyan Voronetsky, Roman and Evstafiy Helmitsky, Klechkovsky, Balandovichi and others. When the Balandovichs lived in A.E. Rosen's house, it was decided to do some restructuring of the house. A building was added to the existing house along the street. Thus, A.E. Rosen's house was doubled. An entrance and eight windows overlooking then Dvoryanskaya Street appeared (Fig. 1). Currently, this street is called Sovetskaya [2].

In 1867, A.E. Rosen's house had the next stage of restructuring and reconstruction. Due to the fact that in 1867 A.E. Rosen's house became the property of the city of Kurgan, it was decided to place a hospital there. Soon a plan was drawn up for the reconstruction and redevelopment of A.E. Rosen's house. First, an anatomical hall was added, and then the internal layout of the house was partially changed [3]. At that time, it was decided to add a huge basement. It should be noted that the hospital was located in A.E. Rosen's house until 1882, and then it was moved to a new modern building [4].

It is known that for several years A.E. Rosen's house was empty after the hospital left. Then, in 1885, the Trinity Parish School moved to the empty building, which was located there until 1889. At that time, no rebuilding and restoration work was carried out [5].

In 1891, a Public Assembly appeared in Kurgan, which was located in A.E. Rosen's house. From that time, the next stage of reconstruction and restructuring of this building began. The house was in need of restoration which was quickly completed. At this time, out of necessity, a library was made and a buffet was opened. Then they designed and opened a restaurant and billiards. Then the first urban garden opened on the territory of A.E. Rosen's house. In 1895, an agricultural exhibition of Western Siberia and the Urals was held in Kurgan. In preparation for this exhibition-fair, it was decided to carry out another reconstruction of A.E. Rosen's house. Firstly, the entrance from the side of the garden was designed, secondly, a triple window was made in the center of the facade, and thirdly, the whole building was finished with clapboard [6].

At the beginning of the 20th century, the need to reconstruct A.E. Rosen's house arose again. At this time, the last significant changes were made. An assembly hall for 250 seats was added to the house on the right side. Then in 1914 it was decided to add a stage for theatrical performances. According to many experts in the field of general history, art history and ethnography, this stage can be considered the final stage in the formation of the modern



Fig. 2 The house of the Decembrist A.E. Rosen today

appearance of the building of A.E. Rosen's house [1].

After the establishment of Soviet power, the following organizations were housed in the building: the House of Pioneers, the operetta theater, the House of Political Education and the library. In 1955, a major overhaul of the building, the former home of A.E. Rosen. Restoration of the premises of the house and landscaping of the garden was carried out. For some time, the city library was located in the left wing of the building, and the hall of the City Council meeting and lectures in the right wing [6].

Currently, in the building of the historical heritage of the former of A.E. Rosen's house houses the music department of the Children's Art School No. 1 (Fig. 2). Music as an art form has a huge spiritual and moral potential, which is a form of aesthetic perception of the world, reflects the diversity of life forms and phenomena in sound images, contributing to the artistic knowledge of life and the preservation of the cultural heritage of the nation.

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Особенности реконструкции дома А.Е. Розена в Кургане во временных рамках исторического развития

Т.В. Саляева¹, В.В. Ячменева¹, Н.М. Емельянова²

¹ ФГБОУ ВО «Магнитогорский государственный технический университет имени Г.И. Носова», г. Магнитогорск (Россия);

² ФГБОУ ВО «Уральский государственный архитектурно-художественный университет имени Н.С. Алферова», г. Екатеринбург (Россия)

Ключевые слова и фразы: архитектурные памятники; временные периоды; историческое наследие; реконструкция; современный аспект.

Аннотация. Цель статьи – проследить исторические этапы реконструкции дома А.Е. Розена в Кургане. Для достижения поставленной цели были определены следующие задачи: рассмотреть исторические этапы заселения дома; провести анализ этапов реконструкции дома, раскрыть особенности реконструкции дома А.Е. Розена в Кургане. Актуальность исследования заключается в том, что в современных условиях реконструкции зданий с историческим наследием недостаточно уделяется внимания его первоначальному виду и планировке. Иногда исторические документы, свидетельствующие о постройке зданий, не дают полной информации о нем, а в некоторых случаях просто утеряны. Сохранение исторического наследия является одной из главных задач в формировании культуры нашей страны и воспитании духовно-нравственной, гармонично развитой личности современной молодежи.

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List of Authors

Ivashnev M.V. – Doctor of Engineering, Professor, Department of Life Safety and Health Preserving, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: ivashnev.mv@yandex.ru

Ивашнев М.В. – доктор технических наук, доцент кафедры безопасности жизнедеятельности и здоровьесберегающих технологий Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: ivashnev.mv@yandex.ru

Kalinin R.K. – Postgraduate Student, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: komers.for@gmail.com

Калинин Р.К. – аспирант Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: komers.for@gmail.com

Vasilyev A.S. – Candidate of Science (Engineering), Associate Professor, Department of Technology and Organization of the Forest Complex, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: alvas@petsu.ru

Васильев А.С. – кандидат технических наук, доцент кафедры технологии и организации лесного комплекса Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: alvas@petsu.ru

Sukhanov Yu.V. – Candidate of Science (Engineering), Associate Professor, Department of Technology and Organization of the Forest Complex, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: yurii_ptz@bk.ru

Суханов Ю.В. – кандидат технических наук, доцент кафедры технологии и организации лесного комплекса Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: yurii_ptz@bk.ru

Matyash V.A. – Candidate of Science (Engineering), Associate Professor, Vice-Rector for Educational Activities, St. Petersburg State University of Aerospace Instrumentation, St. Petersburg (Russia), E-mail: matiash@guap.ru

Матьяш В.А. – кандидат технических наук, доцент, проректор по учебной деятельности Санкт-Петербургского государственного университета аэрокосмического приборостроения, г. Санкт-Петербург (Россия), E-mail: matiash@guap.ru

Olenev V.L. – Candidate of Science (Engineering), Associate Professor, Head of Department of Aerospace Computer and Software Systems, St. Petersburg State University of Aerospace Instrumentation, St. Petersburg (Russia), E-mail: Valentin.Olenev@guap.ru

Оленев В.Л. – кандидат технических наук, доцент, заведующий кафедрой аэрокосмических компьютерных и программных систем Санкт-Петербургского государственного университета аэрокосмического приборостроения, г. Санкт-Петербург (Россия), E-mail: Valentin.Olenev@guap.ru

Frolova E.A. – Doctor of Engineering, Associate Professor, Head of the Department of Innovation and Integrated Quality Systems, St. Petersburg State University of Aerospace

Instrumentation, St. Petersburg (Russia), E-mail: frolovaelena@mail.ru

Фролова Е.А. – доктор технических наук, доцент, заведующий кафедрой инноватики и интегрированных систем качества Санкт-Петербургского государственного университета аэрокосмического приборостроения, г. Санкт-Петербург (Россия), E-mail: frolovaelena@mail.ru

Чепурнова Е.К. – Master's Student, Komsomolsk-on-Amur State University, Komsomolsk-on-Amur (Russia), E-mail: el.chep@bk.ru

Чепурнова Е.К. – магистрант Комсомольского-на-Амуре государственного университета, г. Комсомольск-на-Амуре (Россия), E-mail: el.chep@bk.ru

Andrianov I.K. – Candidate of Science (Engineering), Associate Professor, Department of Aircraft Engineering, Komsomolsk-on-Amur State University, Komsomolsk-on-Amur (Russia), E-mail: ivan_andrianov_90@mail.ru

Андрианов И.К. – кандидат технических наук, доцент кафедры авиастроения Комсомольского-на-Амуре государственного университета, г. Комсомольск-на-Амуре (Россия), E-mail: ivan_andrianov_90@mail.ru

Melnikova M.M. – Student, Far Eastern Federal University, Vladivostok (Russia), E-mail: maryana.melnikova.99@mail.ru

Мельникова М.М. – студент Дальневосточного федерального университета, г. Владивосток (Россия), E-mail: maryana.melnikova.99@mail.ru

Goryachev D.R. – Student, Far Eastern Federal University, Vladivostok (Russia), E-mail: leon335@bk.ru

Горячев Д.Р. – студент Дальневосточного федерального университета, г. Владивосток (Россия), E-mail: leon335@bk.ru

Khaliman M.R. – Student, Far Eastern Federal University, Vladivostok (Russia), E-mail: khaliman.mr@students.dvfu.ru

Халиман М.Р. – студент Дальневосточного федерального университета, г. Владивосток (Россия), E-mail: khaliman.mr@students.dvfu.ru

Zainullina P.R. – Student, Far Eastern Federal University, Vladivostok (Russia), E-mail: zainullinap@gmail.com

Зайнуллина П.Р. – студент Дальневосточного федерального университета, г. Владивосток (Россия), E-mail: zainullinap@gmail.com

Salyeva T.V. – Candidate of Science (Pedagogy), Associate Professor, Department of Design, G.I. Nosov Magnitogorsk State Technical University, Magnitogorsk (Russia), E-mail: salyeva@yandex.ru

Саляева Т.В. – кандидат педагогических наук, доцент кафедры дизайна Магнитогорского государственного технического университета имени Г.И. Носова, г. Магнитогорск (Россия), E-mail: salyeva@yandex.ru

Yachmeneva V.V. – Candidate of Science (Pedagogy), Associate Professor, Department of

Design, G.I. Nosov Magnitogorsk State Technical University, Magnitogorsk (Russia), E-mail: markandmark2@mail.ru

Ячmeneва В.В. – кандидат педагогических наук, доцент кафедры дизайна Магнитогорского государственного технического университета имени Г.И. Носова, г. Магнитогорск (Россия), E-mail: markandmark2@mail.ru

Emelyanova N.M. – Associate Professor, Department of Fashion Design, N.S. Alferov Ural State University of Architecture and Art, Yekaterinburg (Russia), E-mail: nina_m_em@mail.ru

Emelyanova N.M. – доцент кафедры дизайна одежды Уральского государственного архитектурно-художественного университета имени Н.С. Алферова, г. Екатеринбург (Россия), E-mail: nina_m_em@mail.ru

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