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Establishing research methods and systematic approach to the implementation of integrated projects of redeveloping industrial territories

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ABSTRACT

This study is aimed to improve and facilitate the first industrial redeployment life cycle stage: planning. The authors claim that in Russia, neither the planning stage, nor the implementation stage are characterized by effective, scientifically-sound systems. To solve this problem, the authors suggest using the integrated interaction information system consisting of many different functional investment, organizational, technological and information subsystems and modules. It is recommended that the main elements of this information system be grouped into four main functional information macroblocks, one of which is developing the design structure, allocating resources, calculating the duration and costs necessary for the project. With the help of analysis of normative and scientific documentation, carrying out research by means of expert assessment, mathematical processing of results and practical application of the obtained results, an algorithm for creating an organizational and technological model of construction and installation works at the industrial reprofiling facility was developed.

KEYWORDS: production organization, redeployment organization methods, redeployment factors, redeployment of industrial territories, organizational and technological solutions.

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Métodos de investigación y enfoque sistemático para la implementación de proyectos integrados de reurbanización de territorios industriales

RESUMEN

El objetivo de este estudio consiste en mejorar y facilitar la primera etapa del ciclo de vida del redespliegue industrial: la planificación. Los autores afirman que en Rusia, ni la etapa de planificación ni la etapa de implementación se caracterizan por sistemas efectivos y científicamente sólidos. Para resolver este problema, los autores sugieren utilizar el sistema integrado de información de interacción que consta de muchos subsistemas y módulos de inversión funcional, organizativos, tecnológicos y de información. Se recomienda que los elementos principales de este sistema de información se agrupen en cuatro macrobloques de información funcional principales, uno de los cuales es desarrollar la estructura de diseño, asignar recursos, calcular la duración y los costos necesarios para el proyecto. La investigación con la ayuda del análisis de la documentación normativa y científica, la evaluación experta, el procesamiento matemático de los resultados y la aplicación práctica de los resultados obtenidos, se logró un algoritmo para crear un modelo organizativo y tecnológico de trabajos de construcción e instalación en el perfil industrial

PALABRAS CLAVE: organización de producción, métodos de organización de redistribución, factores de redistribución, redistribución de territorios industriales, soluciones organizativas y tecnológicas.

Introduction

The stage of construction is one of the main compulsory periods of the life cycle in the formation of construction end-products, i.e. capital construction projects of various functional purposes. The compulsory assessment of conformity of buildings and structures, as well as design construction, installation, setting up and recycling (demolition) processes associated with buildings and structures is conducted in Russia in the form of state construction supervision. An assessment results in a document certifying conformity of the actual indicators with the requirements of design, normative (industrial) and legislative documents. Conformity is assessed in accordance with procedural rules depending on the functional purpose of the capital construction project. There are two conformity assessment forms that appear to be similar: “construction inspection” and “state construction

supervision". They both characterize an approach used to assess the conformity of activities of participants in the construction operations (customers, developers, contractors) on formation of construction end-products – capital construction projects. These terms differ in so far as the construction inspection implies control by the customer of operations of contractors. State construction supervision authorities undertake supervisory (including inspection) activities in order to identify and crack down on violations of the requirements of technological regulations or other normative legal acts and design documents, committed by the key players in the construction investment activities (customer, developer, contractors), with the involvement of state authorities.

1. Literature Review

To familiarize yourself with the current state of affairs in the question under consideration, as well as to study the latest developments, it is necessary to refer to scientific publications of domestic and foreign formats. The paper considers the articles of such authors as D.V. Topchiy, A.I. Meneiluk, L.V. Lobakova, I. Abramov, A. Lapidus, S. Newton, V.A. Pukhkal, A.B. Mottaeva and others.

At present, well planned and competently staffed integrated structural construction units will help achieve a high level of reliability and labor productivity and avoid negative (extraordinary) situations during the construction period eventually ensuring improved project performance, according to Abramov (2013), stressing the relevance of the topic adopted for the study.

A worthy approach to reforming the structures and functions of management in the enterprise in order to solve the problems of adaptation to the conditions of uncertainty and rapid changes taking place in the external environment is reprofiling. Different scholars (Abramov, *et al.*, 2016; Pukhkal, *et al.*, 2018) discuss the stages of the reprofiling process. The reprofiling process of the enterprise can be presented in three stages:

1) situational analysis and planning of restructuring measures program;

2) implementation of the enterprise reprofiling program;

3) monitoring the reprofiling process and evaluating the effectiveness of the activities carried out.

This work is aimed at suggesting using the integrated interaction information system consisting of many different functional investment, organizational, technological and

information subsystems and modules to approach to the implementation of integrated projects of redeveloping industrial territories.

It has been argued elsewhere that neither at the stage of planning nor at the stage of implementation in our country there are effective, scientifically based systems. The processes on repurposing of objects, which started in the 1990s, were chaotic and non-systemic. Development companies have not formed structured hierarchical systems of management and control of such projects. Besides, there was no system analysis and assessment of a possibility of a look, type and techniques of carrying out similar works. The systematization of management and monitoring in the implementation of reprofiling projects is also not structured and has no scientifically sound deterministic form (Lapidus and Topchiy, 2019). In order to solve the mentioned problem, the authors consider the use of an information complex interaction system consisting of a large number of different functional subsystems and modules, which are investment, organizational-technological and information. In addition, the main elements of this information system should be grouped into four main functional and information macroblocks, one of which is to develop the design structure, allocate resources, calculate the duration and costs necessary for the implementation of the project.

Meneiluk and Lobakova (2017) state that the technology of repurposing or changing the purpose of the building is significantly different from the new construction and has its own peculiarities, which confirms the conclusions made in the first chapter of this work. Parameters such as "project cost, number of working shifts per day, number of working days per week, work combination factor, financing conditions" are mentioned as the most common factors influencing the planning of the repurposing process and having a relationship. The relationship between these parameters, as stated in the publication by Meneiluk and Lobakova (2017), is expedient using mathematical theory of experiment planning, which is a fundamental part of the theory of experimental-statistical modeling.

Thus, literary analysis confirms the relevance of the topic accepted for study, as well as the crucial factors that determine the process of repurposing at the planning stage and the possibilities of finding a relationship between them. The main indicators, based on the scientific sources discussed above, are economic efficiency, internal time loss, scope of work during repurposing. Dependencies between them will be established by using known graphs

of the relationship between the values in question, or based on an investigation if there is no known relationship.

2. Methodology

The most common factors influencing redeployment planning and interrelated processes include parameters such as project cost, the number of work shifts per day, the number of workdays per week, the work combination coefficient, funding conditions. These parameters may be used with the experimental design of mathematical theory. Authors suggest that it is a fundamental part of the experimental-statistical modeling theory [2].

The main indicators based on the scientific sources discussed above include *economic efficiency*, *intra-shift time loss*, *the amount of work during redeployment*, *etc*.

The redevelopment of industrial areas has a number of undeniable advantages for both the investor and the city as a whole, as there are still a large number of industrial enterprises located on large-scale plots of land in the central and adjacent areas of the cities. The investor, first of all, has the possibility to erect the object in a good place, on a plot of sufficient size. For the city - it is a revival of abandoned territories, new jobs, financial flows, renewal and improvement of the portrait of the city, reduction of the number of freight transport (Eddelani et al., 2019; Zeibote et al., 2019). However, despite all the advantages of redevelopment, many project institutions are cautious about developing such development projects because they face a number of serious problems in the process. We will try to give a brief account of these problems.

1) Difficulties of transport maintenance of the territory.

As a rule, the territories of industrial facilities occupy quite large areas of several hectares. In carrying out the complex redevelopment of the territory with the construction of new residential blocks and administrative buildings, there is a need to reconstruct the road traffic connection taking into account new large flows of people. In this regard, one of the most important tasks of the designer in the development of the redevelopment project is to take into account all the parameters necessary for the creation of transport accessibility: reconstruction of existing passages under the necessary load, construction of new roads taking into account the specified capacity, as well as, if necessary, new transport and transfer units of public transport.

In connection with the active redevelopment of industrial zones in Moscow, reconstruction of the Moscow Central Ring (hereinafter - ICC) was carried out: since 1908 it has served as an industrial zone of the "rusty belt" of the capital and mainly performed the function of transportation of goods. The launch of passenger traffic on the ICC solves the issue of transport support of the industrial zone. In addition, the ring linked commuter rail trains and trains that go downtown to MCC stations. Passengers can move to ICC trains without reaching the city center and move on almost all over Moscow.

All MCC stations were built in the form of transport and transfer units (TPU). They include offices, shopping complexes, shops and cafes. This concept meets both the interests of investors, who need to pay back investments in construction, and the needs of citizens.

2) Non-availability of retained buildings and structures for new functions or technologies, as well as the possibility or impossibility of increasing the load on existing communications, networks and infrastructure.

This problem concerns those industrial zones whose redevelopment implies the preservation of existing buildings for various reasons, mainly the need to preserve buildings that are monuments of cultural heritage. As a rule, such buildings are reclassified as administrative or public.

Considering an urgent need of equipping such buildings with all modern engineering systems and communications, designers face a difficult problem of complex re-equipment. If replacement of all internal engineering systems does not make big work, then a much more labor-consuming task is to recalculate loads of outside engineering networks and conditions of connection to city backbone networks.

With the change of the functional purpose also loads of communications change. At the developed building in a historic district of a large city, as a rule, there can be a problem with an increase in the power of the consumed electrical and heat energy, the consumption of water and the number of its reset (Ghani et al., 2019). In this regard, as a rule, when receiving specifications on connection of the reconstructed building there can be an additional volume of design of networks, sewer pump stations and transformer substations.

In addition to all that has been mentioned above, one should not miss the fact that all modern engineering systems and mechanisms have the considerable weight and dimensions. At design it is necessary to consider correctly all loads of a building framework for the analysis of its bearing abilities. Often a gain of parts of the building is required.

3) Economic issues of concept (investment efficiency).

The investment component of the project is one of the most important. As a rule, the greatest investment efficiency can be achieved when implementing known profitable projects. Such could be, for example, dense residential development in prestigious areas of the city, large businesses and shopping centers. But an important aspect of reprofiling is complex construction, which also implies the construction of social facilities, such as kindergartens, schools of park zones, etc. Based on this, the task of the designer is to apply a competent approach in filling the reorganized zone, taking into account the necessary economic efficiency of implementation and social component.

4) Environmental problems of the site and influence of the facility on adjacent territories.

Among other things, the developer (as a result, and the designer) faces the problem of ensuring the environmental cleanliness of the site and the preserved buildings. It is obvious that during the years of operation of a plant, a large amount of harmful substances is accumulated in the soil as well as in the structures of buildings. Accordingly, during the reconstruction of the territory, the developer is obliged to carry out cleaning measures, recultivation and improvement, which leads to an increase in the cost of the project. These costs must be taken into account in the development of the construction organization project and estimates for the preparation of the construction territory (Sugiantiningsih et al., 2019).

In addition to time costs, each redevelopment project requires significant financial investments. Unforeseen expenses include, for example, excavation, where industrial waste may be present, hundreds of millions of rubles may be spent on deactivation, de-chemization and further placement. In order to avoid such unforeseen expenses, the development of project documentation should take into account the abovementioned risks.

5) The problems arising in the course of approval of the project with public authorities.

The development of the project of new city space use and change in the section purpose requires to pass a full stroke of allowing and concord instances. The combination of the planned object to the General plan of the city and the plan of land use and building both in architectural, and in conceptual aspects is important. One of serious problems which builders face, getting permissions to clearing of the existing building, is legalization of air-raid shelters which exist at each industrial enterprise. There is a need of their translation from federal to private property. As of today, there is no universal algorithm for taking actions

connected with such translation yet. Moreover, big difficulties may arise in case of transfer of an industrial facility on the periphery. Even when the enterprise builds a new air-raid shelter, moving to a new platform, it does not grant to it the right to liquidate an old one. Besides considerable time expenditure can be wasted on solving the problems connected with architecture monuments which can be in territories of the former industrial zones. Similar encumbrances impose restrictions of a possibility of device of similar objects for new functions. There is a need of saving and restoring the facades of buildings protected by the state, and in some cases also elements of building constructions. The designer is obliged to observe strict requirements of bodies of protection of monuments to new construction and the planning organization of the territory in security zones. This process is one of the most difficult stages of work as requirements of official bodies are often difficult to formalize as estimates of design solutions are often based on the principle "is combined - not combined" that is an absolutely subjective factor. In most cases, the process of approval of a project with public authorities becomes a big problem, and search of the solution that will satisfy both parties takes considerable time.

A scientific study structure is a strict logical sequence of interrelated stages leading to the achievement of the result set in the study. The scientific study structure of this work is given in Figure 1.

The increasing complexity of modern areas of study requires a thorough analysis of the goals and objectives of the activity, ways and means of achieving them, assessing the influence of various factors on improving the efficiency and quality of work. This leads to the need for widespread use of expert assessments when decisions are made and selected; this scientific study method will be used in this work (Abramov 2018).

Examination as a way of obtaining information has always been used in decision-making. However, studies on its rational implementation only began three decades ago. The results of these studies allow us to conclude that nowadays, expert assessments are basically an established scientific method for the analysis of complex unformalized problems.

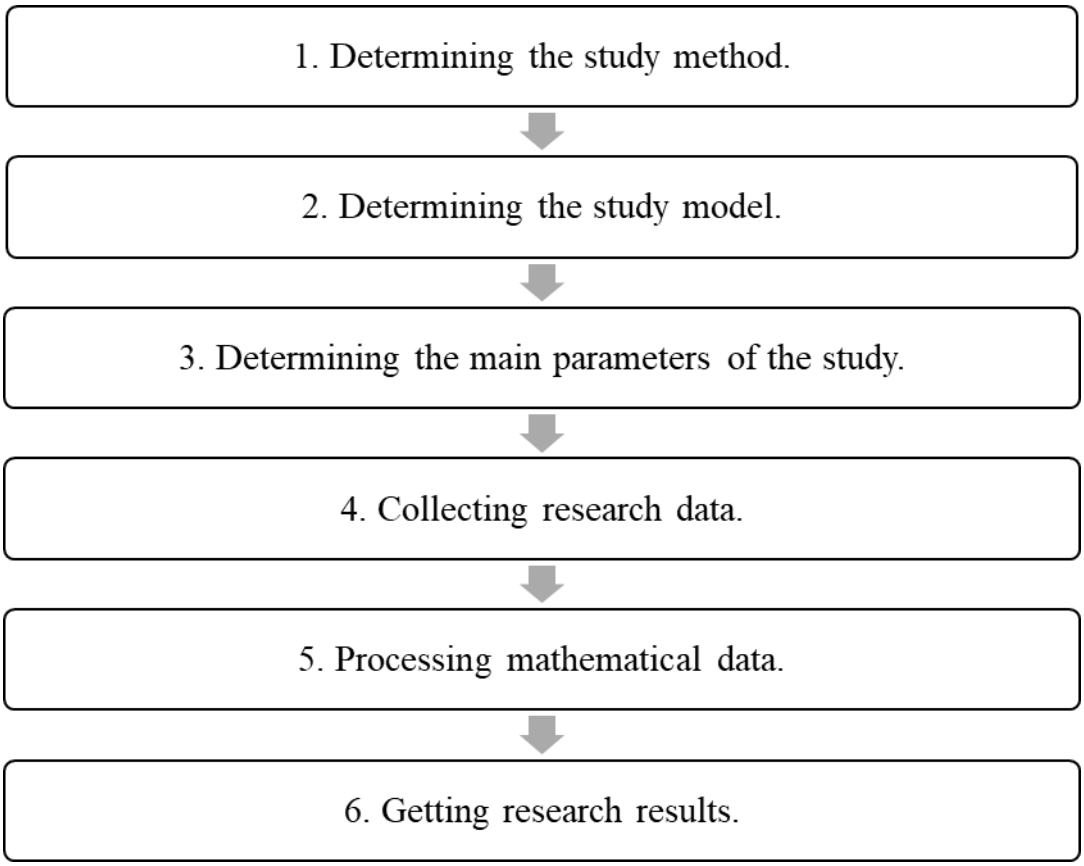

Figure 1. The scientific research structure.

The method of expert assessments is based on the rational organization of expert analysis of a problem with the quantitative assessment of judgments and the processing of their results. The generalized expert group opinion is taken as a solution to a problem.

In the decision-making process, experts carry out information and analytical work on the creation and evaluation of decisions.

The creation of facilities includes the determination of possible events and phenomena, the opinion of hypotheses, the formulation of goals, limitations, decision options, the definition of signs and indicators to describe the properties of facilities and their relationships, etc. In the task of evaluating characteristics, experts measure the reliability of events and hypotheses, the importance of goals, values of signs and indicators, and decision preferences. When forming and evaluating the characteristics of facilities, a complex solution of the first two types of tasks is performed. An expert acts as a generator of concepts (ideas, events, decisions, etc.) and tester of their characteristics (Newton 2016).

In solving the problems considered, the whole set of problems can be divided into two classes: those with sufficient information potential and insufficient information potential. For problems in the first bracket, there is the necessary amount of knowledge and experience to solve them. Therefore, in relation to these problems, experts are high-quality sources and measure the information accurately. For such problems, the generalized opinion of a group of experts is determined by gauging the average of their individual judgments and is close to true.

Regarding the problems in the second bracket, experts can no longer be regarded as sufficiently accurate meters. The opinion of one expert may be correct, even though it is very different from the opinion of all other experts. Processing the examination results in solving the second type of problems cannot be based on average methods.

The method of expert assessments is used to solve the problems of forecasting, planning and developing activity programs, labor standards, the selection of promising equipment, product quality assessment, etc. To apply the method of expert assessments in the decision-making process, the issues of selecting experts, conducting a survey and processing its results must be considered (Abramov, *et al.*, 2016).

The selection of quantitative and qualitative composition of experts is based on the analysis of a problem's breadth, the required reliability of the estimates, the characteristics of experts and the costs of resources. The breadth of a problem being solved determines the need to attract experts of various profiles to the examination. Therefore, the minimum number of experts is determined by the number of different aspects and areas that must be considered when solving a problem.

The reliability of estimates of a group of experts depends on the level of knowledge of individual experts and the number of members. If we assume that experts are accurate meters, an increase in the number of experts will increase the reliability of the entire group's expertise.

The characteristics of a group of experts are determined based on individual characteristics of experts: competence, creativity, attitude to expertise, conformism, constructive thinking, collectivism, and self-criticism. Currently, the characteristics listed are mainly evaluated qualitatively. For several characteristics, there are attempts to introduce quantitative estimates.

The characteristics of an expert adequately describe the necessary qualities affecting the examination results. However, their analysis requires very painstaking and laborious work to collect information and study it. In addition, as a rule, some of the expert characteristics are evaluated positively, and some are evaluated negatively. There is a problem of harmonizing characteristics and selecting experts regarding the inconsistency of their qualities. Along with that, the more characteristics are considered, the more difficult it is to decide what is more important and what is acceptable to an expert. To eliminate this difficulty, a generalized characteristic of an expert must be created regarding the most important qualities, on the one hand, and allowing direct measurement, on the other. As such a characteristic, the reliability of expert judgments defining an expert as a "measuring device" can be taken. However, to apply such a generalized characteristic, information on the experience of an expert in problem solving must be collected. In some cases, such information may not be available.

An expert survey is listening to and recording expert judgments on the problem being solved in a substantial and quantitative way. A survey is the main stage in the joint work of management groups and experts. At this stage, the following procedures are performed: arranging organizational and methodological support for the survey; stating the problem and presenting questions to experts; providing information support to the experts' work.

The type of survey determines the type of an expert assessment method. The main survey types are as follows: questionnaires, interviews, Delphi method, brainstorming, discussion.

The choice of a survey is based on the examination objectives, the nature of the problem to be solved, the completeness and reliability of the source information, the time available and survey costs. We shall now consider the content and technology of the abovementioned survey types (Pukhkal and Mottaeva, 2018).

Questionnaire. A questionnaire is a survey of experts involving questions in written form. A questionnaire contains questions that can be classified by content and type.

In terms of their type, the main questions are classified into open questions, closed questions, and questions with several answers. Open questions suggest an answer in an arbitrary form. The answer to closed questions can be given in the form of "yes", "no", or "I don't know". Questions with several answers imply that experts select one of the range of answers suggested.

3. Results

If the solution to a problem is highly uncertain, applying open questions is highly recommended. This type of question means that the problem in question can be broadly covered and a range of expert opinions can be identified. The lack of open questions is the possible wide variety and arbitrary form of answers significantly complicating the processing of questionnaires.

Closed questions are asked when two clearly defined alternatives are considered, when it is extremely necessary to determine the scope of most opinions on these alternatives. Processing closed questions does not cause any difficulties (Lapidus and Abramov, 2018).

In addition to the questionnaire, experts get a brief: an explanatory note explaining the goals and objectives of an examination, which provides the necessary information to the expert, as well as instructions on filling out a questionnaire and the necessary organizational information.

Interviewing is an oral survey conducted in the form of an interview. When preparing an interview, the interviewer creates questions for the expert. A typical feature of these questions is the expert's ability to answer them quickly, since the expert does not have time to think them over.

An interview topic may be communicated to the expert in advance, but specific questions are asked directly during the conversation. Preparing a sequence of questions from simple to gradually more detailed, complicated, and specific is recommended.

The advantage of an interview is the continuous live contact of the interviewer with the expert, allowing the interviewer to quickly obtain the necessary information through direct and clarifying questions depending on the expert's answers.

The disadvantages of an interview are the possibility of the interviewer having a strong influence on the expert's answers, the lack of time to reflect on the answers and the high costs associated with interviewing all the experts.

The interviewer must have good knowledge of the problem being analyzed, be able to clearly formulate questions, create a relaxed atmosphere and be able to listen.

The Delphi method is a multi-phase questionnaire which processes and reports the results of each phase by having the experts work incognito alongside each other. The method is named after the Greek city, where the famous ancient oracle lived (Cha and Lee, 2015).

Well-known Delphi method application examples include posing questions which require a numerical evaluation of parameters as answers.

When conducting a survey using the Delphi method, the idea that experts answer anonymously is preserved. It ensures the exclusion of the conformity influence, i.e. suppressing one's opinions due to the "weight" of a scientific authority or official position of some experts in relation to others.

To increase the Delphi-based examination effectiveness, the process of fixing, processing and communicating information to experts must be automated. It is achieved by using a computer (Kim and Park, 2006).

Brainstorming is a group discussion with the aim of obtaining new ideas and solutions to a problem. Brainstorming is literally called a 'brain attack' in Russian, a method of generating ideas. A typical feature of this type of examination is an active creative search for fundamentally new solutions in difficult deadlock situations, when the known methods and solutions are unsuitable. To maintain the activity and creative imagination of experts, criticizing their statements is strictly prohibited.

The basic organization rules and the brainstorming technique are as follows: Experts are chosen in a group of up to 20-25 people, which includes specialists of the problem being solved and people with a broad education and rich imagination. Moreover, they do not necessarily have good knowledge of the problem under consideration. These may be persons occupying the same official and social position in the group is recommended to ensure greater independence of expression and the creation of an atmosphere of equality.

While ideas are being generated and discussed, direct criticism is prohibited, but it takes place in an implicit form and is expressed in the degree of support and development of statements (Pezeshki and Ivari, 2018).

There are several types of brainstorming offered, from alternate five-minute sessions involving reflection on their results, alternate periods of idea generation and discussions, and group decision-making, applying the sequential stages of proposing and discussing them, including the idea "amplifiers" and "suppressors", etc. Brainstorming is used to solve a variety of applied problems.

This examination type is widely used in practice to discuss problems, ways to solve them, and to analyze various factors, etc. To conduct the discussion, a group of experts of not more than 20 people is formed. The management group conducts a preliminary analysis of

the discussion problems to clearly formulate tasks, determine requirements for experts, requirements for their selection and methods of conducting the discussion. The discussion is conducted as an open collective discussion of the problem considered, the main task of which is to comprehensively analyze all factors, positive and negative consequences and identify the positions and interests of participants. Criticism is permitted during the discussion.

The survey types considered are complementary and interchangeable to a certain extent. To generate new concepts (ideas, events, problems, solutions), using brainstorming, discussions, questionnaires and the Delphi method is recommended (first two phases).

A comprehensive critical analysis of a list of concepts can be effectively conducted in the form of a discussion. Questionnaires and the Delphi method are used for quantitative and qualitative assessment of properties, parameters, time and other characteristics of concepts. Interviewing must be used to clarify the results obtained by other types of expertise.

After surveying a group of experts, the results are processed. The initial information is numerical data expressing the preferences of experts and a substantive substantiation of these preferences. The processing is aimed at obtaining generalized data and new information contained in the hidden form of expert assessments. Based on the processing results, a solution to the problem is formulated.

Both numerical data and substantive expert statements lead to the need to apply qualitative and quantitative methods to process the group expert assessment results. The specific gravity of these methods substantially depends on the class of problems solved by an expert assessment. We will consider methods to solve the first-class problems, described by sufficient information potential. These problems are most common in decision-making (Hasik, *et al*., 2019).

Depending on the expert assessment objectives, the following main tasks are solved when processing the survey result: determining the consistency of expert opinions; creating a generalized assessment; determining the relationship between expert judgments; determining relative weights of things; assessing the reliability of the result being examined.

4. Discussion

To confirm the validity of the hypothesis that experts are accurate testers, the consistency of expert assessments must be determined and possible groupings in an expert group identified. The consistency of expert opinions is assessed by identifying a quantitative

measure describing a proximity degree of individual opinions. The analysis of consistency measure values contributes to the development of a correct judgment about the general level of knowledge on the problem being solved and the identification of groups of expert opinions due to the difference of views, concepts, scientific schools, the nature of professional activity, etc. Kamar, *et al.*, 2019).

By processing the expert assessment results, the relationships between the judgments of various experts may be determined. Identifying these dependencies allows us to establish the degree of proximity of the expert opinions. Determining the relationship between the estimates of facilities built on various comparison indicators is of great importance, as it allows us to determine related comparison indicators and to group them according to the extent of the relationship.

This method allows us to exclude the impact of personal qualities such as conformism and collectivism, which may affect the study results. Kolmogorov's statistical criterion will be an indicator of the reliability of the results obtained.

Conclusions

We have therefore considered the classification of current organizational and technological models, indicated the characteristics of redeployment as a building process, and affirmed the importance of the impact of considering the redeployment characteristics on the quality of the final organizational and technological construction and installation models, as well as ways to establish the influence of dependencies between the main indicators of redeployment as a building process by means of mathematical study along with the subsequent statistical processing of the results and construction of the desired graphs showing the relationship between values.

The direction of redevelopment of industrial zones has been born in Russia relatively recently, which explains the many existing problems related to the implementation of projects for the development of production areas, among which there are problems related to the reprofiling of facilities, the transfer of bomb shelters from federal to private ownership, among other things there are problems of preserving the environmental purity of the site, etc. Issues related to the redevelopment of industrial zones, as the practice shows, are of interest to the public, analysts, business communities, periodically they are engaged by some consulting companies, they are actively discussed in the media, at scientific conferences and

round tables. Despite many difficulties, in some regions of Russia, such as Moscow, St. Petersburg, etc., there are already a number of successfully implemented projects for the development of industrial areas. The successful practice of using redevelopment abroad shows that the development of industrial zones is carried out in the form of projects executed in the form of a municipal redevelopment plan. Despite the fact that the issue of the development of industrial zones is current for a number of Russian cities, copying the experience of foreign companies is hardly applicable in the current conditions, primarily because there are no necessary legislative acts in the domestic legislation defining the procedure for the application of redevelopment procedures. In this regard, a great responsibility falls on the designer, who under the existing conditions must fulfill his own obligations, namely to develop quality project documentation, in such a way as to ensure the investment component of this project, as well as to minimize the risks of unforeseen expenses during construction and installation works.

In this work, with the help of analysis of normative and scientific documentation, carrying out research by means of expert assessment, mathematical processing of results and practical application of the obtained results, an algorithm for creation of organizational and technological model of construction and installation works at the industrial reprofiling facility was developed.

As a result of the study, the following tasks have been solved:

- searching world literary sources for innovations;
- defining factors influencing construction and installation works during repurposing of industrial facilities;
- investigating relationships between repurposing factors;
- drawing up an algorithm of developing an organizational and technological model based on the results of the study;
- testing the results of the work.

Further study of the issue discussed in the work consists in a more detailed study of factors affecting the duration of works during repurposing, search for other circumstances affecting construction and installation works, and determination of the extent of this impact.

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