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MECHANISMS FOR THE VALUE MANAGEMENT OF INNOVATIVE PROJECTS

There are determined the value management model of a knowledge-based organization, the resource value of a knowledge-based organization, its internal and external energy in the article. The main position in the structure of modern science is the definition of energy – a single measure of various forms of movement and synergy of substance. The proposed model is aimed at forming of portfolio or program that are effective for achieving of the strategic goals of a project-oriented organization. The definition of dominant values allows forming of a value-oriented development portfolio, that allows movement of the project organization to a new level of competitiveness. The value-based project's approach is best suited to the challenges of the global economy and global competition. Using of the value approach in management of the project-oriented organization allows solving of a complex of tasks for calculating of project value for all stakeholders, forming of an effective portfolio of organization's projects, assessing of the effectiveness of various types of organization resources, assessing of the achievability of strategic goals without attracting external sources of value.

Keywords: project management, project-oriented organization, value, innovation.

У статті визначено коефіцієнт цінності ресурсів наукомісткої організації на основі запропонованої моделі управління цінністю проектно-орієнтованої організації, а також її внутрішня і зовнішня енергія. Запропонована модель спрямована на формування портфеля або програми проектів, ефективних для досягнення стратегічних цілей проектно-орієнтованої організації.

Ключові слова: управління проектами, проектно-орієнтована організація, цінність, інновація.

В статье определен коэффициент ценности ресурсов наукоемкой организации на основе предложенной модели управления ценностью проектно-ориентированной организации, а также ее внутренняя и внешняя энергия. Предлагаемая модель направлена на формирование портфеля или программы проектов, эффективных для достижения стратегических целей проектно-ориентированной организации.

Ключевые слова: управление проектами, ценность, проектно-ориентированная организация, инновация.

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Introduction. The use of methods for assessing of the effectiveness of project-oriented organizations can improve the quality of management decisions at all levels of enterprise management from individual projects to corporate governance and allocation of investments.

As a methodological basis for the management of such organizations, a value approach is appeared, the conceptual model of which is presented in [1].

The model proposed in the work is aimed at forming of portfolio or program of projects that are effective for achieving of the strategic goals of a project-oriented organization.

Despite the close attention paid by specialists to solving this problem, the effectiveness of practical implementation of individual projects, portfolios and programs remains at a very low level.

Even more objective and reliable estimates are important in the implementation of state targeted programs and priority national projects involving companies carrying out productive activities through the implementation of a number of separate projects [2].

Analysis of the main achievements and literature. The theory of strategic management considers the development of any organization as a process of purposeful movement towards the formulated strategic goals [3].

The use of natural-science models in the description of project management processes was reflected in works [4; 5; 6].

The most noticeable features of a project-oriented organization are manifested in the following areas:

- in the system of personnel requirements, which must have a unique set of skills, and in a system of motivation that must meet these requirements;
- in the organizational structure of the organization, which implies the possibility of free manipulation of human resources in projects, regardless of their assignment to certain functional units;
- in the structure of the budget of the organization, based on the budgets of individual projects;
- in the organization of business processes, based on the availability of stringent requirements for deadlines and project budgets, as well as the quality of the result.

The success of a project-based organization largely depends on how well the resources are used.

It is planned to form temporary teams on the basis of permanent functional divisions of the organization, created for specific projects.

When using such structures, both the allocation of resources and the management procedures become more complicated [7].

Depending on the scale of the organization and the characteristics of the project portfolio, the following components can be developed:

- regulations for the formation and monitoring of portfolio sales;

- methods for individual areas of portfolio management (methodology – for ranking projects, methodology for selecting projects in the portfolio and others);

- templates of working documents on portfolio management.

Based on the hypotheses examined, it is proposed in [8] to study the regularities of the organization's movement in the space formed by the strategic goals of the organization, using field physics methods, proceeding from the fact that projects implemented by the organization are often considered as driving forces [9].

Development of the value management model of the project-oriented organization, which will allow to solve the task of forming an effective portfolio of the organization's projects in terms of achieving strategic goals, is the purpose of the study.

Materials of research. The basic position in the structure of modern natural science is the definition of energy as a single measure of various forms of motion and interaction of matter [10]. Matter exists in nature in the form of substance and field.

Consequently, it can be concluded that the organization functions as a substance moving and interacting with other organizations in the field of the market environment.

The materialist conception suggests that matter is everything that the surrounding world consists of, a multitude of phenomena, objects and their systems, the bearer of all the various properties, relations, interactions of objects and forms of motion [11].

Important stages in the successful achievement of the project objectives are the identification of the composition of the project participants, the definition of their role and interaction order, the formation of a project management team, and the construction of an organizational structure.

Let's formulate on the basis of the analogy method several key approaches that will form the theoretical basis of the value model of management of a project-oriented organization.

The total value of an organization, as a system, can be considered as a sum of its internal and external values.

The internal value of an organization depends only on its state:

- fixed assets;
- working capital;
- intangible assets;
- the level of staff qualifications;
- perfection of the management system used.

Thus, in projects there are two interconnected resource groups:

- material and technical (raw materials, materials, structures, components, energy, technological resources, installed equipment);
- labor (carry out the direct work with material and technical resources).

The internal value of the organization in the transition from one state to another will be equal to the difference between its values in the final and initial states, regardless of the trajectory on which the transition was made.

That is, the internal value includes the value of all types of resources of the organization and is a function of its state.

The external value of the organization characterizes the processes of its interaction with other organizations and the environment.

The external value consists of two components:

– kinetic (determined by the speed of the organization by changing the parameters of the organization's strategic goals in time);

– potential component (the distance between the current state of the organization and the desired in the space of the «target» coordinates).

During the implementation of a project, the organization either increases its internal value, or moves in the direction of the «desired» position in the space of strategic objectives.

Based on these hypotheses, you can define the project as a focused process of creating or transforming values for all stakeholders.

The law of conservation of values assumes that, in the absence of external influences, the value of an isolated system remains constant, only the process of converting one type of value into another takes place in the organization.

The value model can be used to solve a number of problems of managing project-oriented organizations, for example, using the law of conservation of value, one can calculate the theoretical possibility of achieving strategic goals without using external borrowing.

A similar method can solve the problem of determining the necessary amount of investment to implement the company's strategy.

The task of the portfolio management is critical for the organization, because ensures the linking of projects with the strategy and the adoption of the most effective and necessary for the organization of projects.

The main goal of the project portfolio creation phase is the formation of a system of projects that can potentially be initiated and accepted for implementation. At this phase, the project (investment) initiatives and applications are collected without taking into account the financial and other limitations of the organization.

One of the main tasks of portfolio management of an organization is the task of forming an effective portfolio of projects.

Methods for analyzing the project portfolio are based, on the one hand, on careful risk analysis and, on the other hand, on determining the most effective criteria that can act as a measure of project and portfolio returns.

We will solve the problem of forming an effective portfolio of projects based on the proposed value model.

Let the organization have a potential implementation opportunity P of various projects and n types of resources in quantity of Q_i .

In this case, each project A_p requires for its implementation w_{pi} resources of i -kind and is evaluated for g strategic purposes.

In this case, the resources of each type required for the implementation of the project portfolio are determined by summing up the resource amounts of this type for all projects included in the portfolio.

The development and selection of the strategy are carried out at three different levels:

- functional (strategy is developed for each functional unit in order to specify the chosen project strategy);
- corporate (general direction of development, strategy of growth, conservation or reduction);
- business (competition of goods in a particular market).

The choice of the strategy for the development of the project-oriented organization should be carried out within the framework of the general direction of activity already chosen:

- leadership in costs – high level of technological processes;
- strategy of differentiation – uniqueness in any direction;
- concentration on certain areas – a group of customers, a product range.

It should be noted that if we reject this assumption, in general, to solve the problem of portfolio formation, it is necessary to compare all possible portfolios.

Thus, the system of restrictions of the domain of admissible solutions can be written as

$$\sum_{i=1}^T W_{pi} \leq Q_i, \quad i=1, 2, \dots, n. \quad (1)$$

The task of forming an effective portfolio can be formulated in this way: either, if the function of aggregating estimates is given, find the best portfolio from the point of view of the value of the aggregation function; either find all the Pareto-optimal portfolios that satisfy the resource constraint and provide the decision maker with a choice from this set.

As an objective function of portfolio optimization, it is possible to take the degree of organization's achievement of its strategic goals, that is, to minimize the distance between the point characterizing the state of the organization after the implementation of this portfolio and the point corresponding to the desired state of the organization [12].

Let $j=1, 2, \dots, m$ – multiple objectives of the organization, R_j^2 and R_j^0 – the values of the target parameters of the organization in its desired state and as a result of the implementation of the adopted portfolio of projects, respectively [13].

The formation of an effective portfolio of projects occurs in accordance with the model

$$L = \sqrt{\sum_{j=1}^m [(R_j^2 - R_j^0)^2]} \longrightarrow \min. \quad (2)$$

With the help of the developed model, it is also possible to rank various types of organization resources by their value.

To obtain numerical solutions, the linear programming method is used.

Suppose that at the initial time t_1 the value of the first type of resource was E_j^α , and at the time t_2 the value was E_j^β . The difference between E_j^α and E_j^β is explained by the physical wear and tear of this type of resource of the project-oriented organization.

From the external environment or internal reserves of the enterprise, by carrying out maintenance or modernization work during this period of time, additional value was added to this resource ΔE_j .

Since over time $\Delta t = t_2 - t_1$ the i - resource participated in the implementation of a number of projects, the total value of the organization has changed by the amount of ΔV [14]. It is possible to calculate the so-called coefficient of value – a parameter that characterizes the effectiveness of a given type of resource for the evaluated organization

$$g_j = \sum_{j=1}^m \frac{E_j^\beta - \Delta E_j + \Delta E}{E_j^\alpha}. \quad (3)$$

It should be noted that the physical meaning of the resource efficiency coefficient is analogous to its dual estimation in the case of solving the linear programming problem. It is important to emphasize that if the coefficient of value $g_j < 1$, then this resource is inefficient for the organization.

Conclusions. The project's approach, best suited to the challenges of the global economy and global competition, is a value-based approach. The definition of dominant values allows to form a value-oriented development portfolio, through which the project organization can move to a new level of competitiveness. The use of the value approach in the management of development by a project-oriented organization allows to solve a whole complex of tasks in formation of an effective portfolio of the organization's projects in terms of achieving strategic goals, assessing the effectiveness of various types of resources of the organization, assessing the achievability of strategic goals without attracting external sources of value (loans, investments), calculation of project value for all stakeholders.

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