КОРАБЛЕБУДУВАННЯ

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THE MECHANISM OF MANAGING THE VALUES OF STAKEHOLDERS IN THE PROJECTS OF THE FORMATION OF A NEW BRANCH SPECIALIZATION

The way of the values balancing of the stakeholders at the realization of the projects on the creation of the new branch educational speciality on the base of the games theory has been proposed. The formalization of the project main participants strategies gives the possibility to receive the game payment matrices and to identify the optimal strategy of their action for the purpose of the benefit maximization.

Key words: *branch educational specialty, values of stakeholders. bimatrix games, value-oriented management.*

Formulation of the problem in general. Management-by-value methodology structures the approach to organizational development through the creation of values, organization priorities and the needs of stakeholders and customers. Today, projects and programs are viewed as the realization of the mission and the goal of the owner, which leads to the creation of a new value, which is characterized by uniqueness and distinctive features [1]. The main attention of the experts is devoted to the following interpretation of value-oriented management – «management that provides adoption of projects that contribute to prosperity in the future» and «management of regular monitoring of projects and programmes».

Value-oriented management of the stakeholders of higher education development projects requires today the professionalism of management, the ability to manage on the basis of a value-added approach. This involves identifying the common values of the various categories of workers that are the factors of effectiveness and that create the benefits or limitations of the company activity.

Analysis of recent publications on the subject of research. The thorough research of value-oriented project management lies in the works of such well-known scientists as: O. Medvedeva , S. Bushuev, N. Bushueva, N. Yaroshenko, V. Racha, O. Kolyada, O.Yak-hontova, K. Koshkina, V. Molokanova, N. Rulikova, A. Borzenko-Miroshnichenko.

In [2], the definition of the concept of «value» is interpreted by the author as an assessment of the importance of the object for the outside world and its subjective assessment of the environment. In [3], the introduction of a value-based approach to constructing a model for harmonizing the values of stakeholders in the conditions of a turbulent environment is explored.

In [1], we discover the mechanisms of value-oriented development of the organization on the basis of the spiral theory of system development with application of the project approach. In [4], we investigate the system of distribution of values as an instrument of integration of the mental space.

The basis of the concept of value-oriented management of the organization's development is the methodology of project management and the theory of the life cycle of the organization's development. The theory of evolutionary values of the professor of psychology, Clare Graves, states that in response to the changed living conditions, humanity develops new value systems, the level of the dominant values in the organization determines how the company solves problems at each stage of its development [5].

From the standpoint of the author [6], a project or a programme is always associated with the changes that create values for stakeholders and have a result in the form of a new product or service.

The first step in the process of value-oriented development of the system, in accordance with the P2M standard, is the description of the mission, which defines the vision of the dominant organizational value, on the basis of which the corresponding strategy is developed. Next, the strategy must be transformed into the main objective of the programme and the secondary goals that are consistent with the priorities of the organization's development. Value management practices consider the following three functions: to identify value, create value, impose value [7]. The mathematical models are presented. They allow obtaining recommendations for the use of pure and mixed strategies for maximizing the values of players based on models of games with zero sum and bimatrix games [8].

In contemporary scientific literature, little attention is paid to the management of the development of branch educational specialties of higher educational institutions and to the increase of the efficiency of management of such projects through the management of the stakeholders by the provision of new educational services. The success stories and success factors for these projects, as well as the reasons for the disruption, have not been studied.

The purpose of the work is to develop, on the basis of game theory, a mechanism for balancing the values of stakeholders when implementing projects for the creation of a new branch training specialty, in determining the stakeholders of the educational project to determine which categories of participants affect their results, what their impact may be, as well as to measure the degree of interest.

Main part. A higher educational institution, entering the market of educational products and services with its own educational programmes, produces specialists of various levels and profiles that have mastered the educational programs offered by the university.

As a result of the development of these educational programmes, graduates have acquired the knowledge, skills and abilities which are necessary for the modern labour market. The higher educational establishment, in the end, provides labour, does not receive direct material benefits, but expects to receive feedback from its target audience in the form of raising the prestige of the university, increasing the influx of entrants (ie, demand for educational programmes), strengthening its competitive position among other universities [6].

The projects of a higher educational establishment are supposed to mean preparation of specialists in different specialties, scientific subjects and provision of other educational services. Since the state issues a license to a higher education institution to provide a particular educational service or to develop a scientific subject for a certain period of time with limited resources, the indicated results, each of the above categories of services is a project (a unique activity, with a beginning and an end, aiming at achieving a predetermined result for limited resources). Each project uses the resources provided by a certain functional unit. Project managers have the project authority and are responsible for integrating all types of activities related to the implementation of this project. For the effective operation of any system, there must be a clear and well-organized management process [9].

Today, the Ministry of Education and Science of Ukraine seeks to establish high and clear requirements for the performance of higher education institutions. The procedure has been substantially simplified and, at the same time, new, much more stringent requirements are established, under which the higher education institution can be accredited, to obtain the status of a scientific institution that can claim state support [10]. In the process of achieving the goals of the organization, one must take into account the various interests of the various stakeholders who will represent a certain type of informal coalition. There may also be various relationships between stakeholders, which do not always have the nature of co-operation, coincidence of interests, but may be competitive [11].

For example, taking into account the values of the university, we are using the study of behavioral mechanisms of stakeholders and the use of these mechanisms to assess the success of stakeholder management in the preparation of future specialists at the International Training and Consultation Point. As can be seen from the conducted research, the National University of Shipbuilding named after Adm. Makarov (NUS) under the Contract organizes and provides training for Georgian citizens jointly with the Batumi Study-and-Navigation University (hereinafter BNNU) in accordance with the curriculum. During the training, the educational, material resources and teaching staff of the BNNU are involved in accordance with the existing training licenses. In this case, the values of the organization are preserved, the parties are liable in accordance with the current legislation of Ukraine for non-fulfillment or inappropriate fulfillment of obligations under this Contract. Since a large number of people with different knowledge in different fields are involved in the implementation of a project or a programme, they must target their efforts to achieve a single goal and achieve a commonly planned outcome [12].

Table 1

**Potential participants of the project
on the educational services grant**

Rector	Employers	State
Heads of the University Units	Partners, Special Universities and Enterpris.	Ministry of Higher Education., employment center
University Structural Units	*University entrant, bachelors*	*Media*
Work Project Group	University Research and Educational	Interested groups
Customers	*Investors, Economic Partners*	*Municipality*
Ports, crew companies, shipbuilding plants	Trade Associations	Universities – competitors
Key consumers	*Creditors*	*Analytics*

Therefore, without a holistic concept of value-oriented management, it is not possible to encompass a whole range of issues and participants or stakeholders of the programmes of development of branch educational specialties of universities.

Let us turn to one of the directions of applied mathematics – decision-making, namely quantitative methods. They are based on a scientific and practical approach, which involves the selection of optimal solutions by processing large amounts of information. Depending on the type of mathematical functions, laid down in the basis of models, they distinguish:

a) linear modeling – linear dependencies are used;

b) dynamic programming – allows you to enter additional variables in the process of solving problems;

c) probabilistic and statistical models – are implemented in the methods of the theory of mass service;

d) *the theory of games* – the simulation of such situations, the decision making in which one should take into account the divergence of interests of different units. The basic concepts of game theory are interpreted as follows: the mathematical model of a conflict situation is called a game, the parties involved in the conflict-players, and the outcome of the conflict – a solution [13, p.174].

When defining stakeholders of the educational programme, it is necessary to find out what categories of participants affect their results, what their impact might be, and to assess the degree of interest. The identification of priorities among stakeholders also generates ideas about the types of strategies that are most suitable for managing them. Distributing the project stakeholders to the categories of Customers

(A) and Performers *(B)*, we consider the signs of conflict of values of players in the project for the formation of a new branch specialty. The authors present a solution to the optimization problem performed by the simplex method.

$$C_A = \begin{bmatrix} 6 & 8 & 9 & 7 & 1 \\ 7 & 1 & 5 & 4 & 5 \\ 2 & 9 & 3 & 4 & 5 \\ 4 & 9 & 1 & 6 & 3 \\ 4 & 6 & 8 & 8 & 4 \end{bmatrix}, C_B = \begin{bmatrix} 8 & 6 & 2 & 3 & 6 \\ 6 & 1 & 8 & 8 & 3 \\ 5 & 8 & 4 & 2 & 6 \\ 1 & 2 & 1 & 4 & 9 \\ 2 & 4 & 7 & 8 & 2 \end{bmatrix}$$

Payment matrices of players *A* and *B*.

$$\alpha_A = 4, \beta_A = 5, \alpha_B = 2, \beta_B = 8$$

$$X_A = \left[\frac{2}{407}, \frac{190}{407}, \frac{134}{407}, \frac{12}{407}, \frac{69}{407} \right], \nu_A$$
$$= \frac{1934}{407}, \{4.8\}, Y_B = \left[\frac{125}{2064}, \frac{107}{516}, \frac{41}{688}, \right.$$
$$\left. \frac{727}{2064}, \frac{661}{2064} \right], \nu_B = \frac{9961}{2064}, \{4.8\}$$

$$X_A = (0.0049, 0.47, 0.33, 0.029, 0.17), Y_B$$
$$= (0.061, 0.21, 0.060, 0.35, 0.32)$$

Solution on the basis of linear optimization.

$$Y_A = \left[\frac{138}{407}, \frac{89}{407}, \frac{1}{37}, \frac{21}{407}, \frac{4}{11} \right], \nu_B$$
$$= \frac{1934}{407}, \{4.8\}, X_B = \left[\frac{377}{2064}, \frac{443}{2064}, \right.$$
$$\left. \frac{659}{2064}, \frac{89}{1032}, \frac{407}{2064} \right], \nu_A = \frac{9961}{2064}, \{4.8\}$$

$$Y_A = (0.34, 0.22, 0.027, 0.052, 0.36), X_B = (0.18, 0.21, 0.32, 0.086, 0.20)$$

Conclusions. According to the results of the conducted research, the following statements can be made.

In order to balance the values of stakeholders when implementing projects for the creation of a new branch specialization, it is expedient to use the theory of games.

Formalizing the strategies of key project participants enables us to receive payment matrices of the game and determine the optimal strategy of their behavior in order to maximize the benefits.

Further research should be conducted in the direction of substantiation of various forms of play.

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**МЕХАНІЗМ УПРАВЛІННЯ ЦІННОСТЯМИ ЗАЦІКАВЛЕНИХ СТОРІН
У ПРОЕКТАХ ФОРМУВАННЯ НОВОЇ ГАЛУЗЕВОЇ НАВЧАЛЬНОЇ СПЕЦІАЛЬНОСТІ**

Запропоновано механізм балансування цінностей зацікавлених сторін при реалізації проектів створення нової галузевої навчальної спеціальності на основі теорії ігор. Формалізація стратегій основних учасників проектів дає змогу отримати платіжні матриці гри та визначити оптимальну стратегію їх поведінки з метою максимізації вигід.

Ключові слова: галузева навчальна спеціальність, цінності стейкхолдерів, біматричні ігри, ціннісно-орієнтоване управління.

**МЕХАНИЗМ УПРАВЛЕНИЯ ЦЕННОСТЯМИ ЗАИНТЕРЕСОВАННЫХ СТОРОН
В ПРОЕКТАХ ФОРМИРОВАНИЯ НОВОЙ ОТРАСЛЕВОЙ УЧЕБНОЙ СПЕЦИАЛЬНОСТИ**

Предложен механизм балансирования ценностей заинтересованных сторон при реализации проектов по созданию новой отраслевой учебной специальности на основе теории игр. Формализация стратегий основных участников проектов дает возможность получить платежные матрицы игры и определить оптимальную стратегию их поведения с целью максимизации выгод.

Ключевые слова: отраслевая учебная специальность, ценности стейкхолдеров, биматричные игры, ценностно-ориентированное управление.