Methodological Approach to the Implementation of the Biadaptive Development Program in the Organization on the Basis of Cognitive Improvement of Key Competencies

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Abstract
Improving the individual competencies of team members, organizational competence and key competence of the project-oriented organization is a task, which is based on cognitive models. The paper devoted to formulating the methodological approach to implementation in project-oriented organizations programs of biadaptive development on the basis of cognitive improvement of their key competencies. The concept of key competence has been further developed. The concept and ways of project-oriented organizations key competence development as the basis of the cognitive mechanism for ensuring the success of their biadaptive development programs are formulated. In the development of existing research, a model of key competence of the project-oriented organization biadaptive development program is proposed. It is concluded that usage of standard methods of linear optimization is not enough to solve complex problems of biadaptive development programs, because the classical problem of linear optimization does not take into account additional conditions that arise during the transition from one state to another in biadaptive development programs. For such tasks, it is offered to use the algorithm of drawing up a double problem. The proposed formalization will help solve the problem of synchronized development of staff competencies in order to obtain cognitive synergy and improve the cognitive potential of the project-oriented organization in the biadaptive development programs. Holacracy as an approach of biadaptive cognitive improvement of project teams likewise in biadaptive development programs of project-oriented organizations is offered. Prospects for further research in the chosen direction are presented.

Keywords 1
Project-oriented organization, development program, biadaptivity, competencies, cognition.

1. Introduction

Improving the practice of project-oriented organizations in today's conditions of growing uncertainty and the prevailing digitalization of business processes requires scientifically approaches. Such approaches should be aimed at developing the competencies of project teams and operational management personnel in the perspective of knowledge accumulation and the appropriate implementation of cognitive models and methods. The methodological basis of such development can be biadaptive management, which coordinates the activities of the design and operational subsystem of the project-oriented organization, ensuring their mutual adaptation.

Project-oriented management at the present stage accumulates scientific development of competence, cognitive development to increase the technological maturity of project teams, as well as

initiative [1,2] and predictive models [3] to form a sustainable trend towards projected and sustainable development of project-oriented management systems.

2. Problem statement

Further development of the scientific basis of project-oriented management of organizations should be aimed at detailed justification of the laws inherent in this field of knowledge, which will build models, develop methods, tools and mechanisms for project activities in various subject areas. A prominent place in a number of studies of theoretical foundations formation of project management belongs to the Ukrainian and Japanese scientists [4, 5].

These studies are prerequisites for the development of a methodology for proactive foresight management of project-oriented organizations. Existing approaches are discussed below.

Most approaches require the creation of a group (team) to manage the biadaptive development program and teams implementing projects [6].

At the final stage of architecture management, units for managing the biadaptive development program are formed - a group and program management teams. They are staffed with program managers and executives who will be responsible for managing program integration. The cognitive potential of such teams should be formed through the synergy of their competencies.

Such units determine the priority to achieve certain parts of the mission, the size of the program and the format of its components. It also defines the specific goals of the company, the achievement of which is supported by the size and complexity of the program, determines the relationship with the operational management system within the implementation of biadaptability.

Then project teams that make up the program are formed. This formation is mainly implemented in three ways.

1. Selection of team members from within the project-oriented organization.
2. Selection of team members based on equity participation of stakeholders in the biadaptive development program.
3. Selection of team members from outside on the outsourcing basis.

If a project-oriented organization is unable to implement a biadaptive development program on its own, several stakeholders form an association (consortium) to implement such a program and create an appropriate team.

Such associations are most often used in the implementation of knowledge-intensive or venture programs, as well as in the field of contractors working in large programs or meta-projects created by stakeholders, and engaged in large-scale development projects, including government contracts and public-private enterprise schemes.

In the third case, the company implementing the biadaptive development program, by studying proposals and conducting direct negotiations, assesses the technical capabilities of external organizations, the level of their combined competence in project management and their staff, as well as their ability to fulfill commercial tender conditions.

In general, a project-oriented organization that manages a biadaptive development program must approve the following provisions within the corporate culture:

- to manage a biadaptive development program, it is necessary to have a properly staffed unit. Staff must have all the necessary competencies in accordance with the competency model of program management;
- competently selected project teams must participate in the program, the overall competence of which must correspond to the cognitive standard approved in the corporate culture;
- project teams must implement project missions, effectively organized in accordance with the methodology of project management, technically staffed, have autonomous mechanisms that implement biadaptability, and be accountable to the program manager;
- the program should establish a mechanism for the integration of its constituent projects on the joint competence basis;
- the program should create a mechanism for working with risks and changes in the environment to manage the current level of achievement of the value of the program in the coordination of operational and project activities;

- the program forms an implementation space in the form of a program community, within which the overall competence of project management forms the cognitive potential of biadaptive development;
- individual competencies of program management participants. Aggregate program management competence and successful program decisions should be accumulated in the knowledge base and used for further program management based on cognitive algorithms.

Formation of a detailed implementation plan [7]. The gaps between the conceptual plan of the biadaptive development program and the plans for the implementation of projects that shape it are identified when building project teams and determining their capabilities and competencies. Development of detailed implementation plans increases the likelihood of projects. At this stage of the work, considering the boundaries of projects, schedules, budgets and interfaces, the integration of calendar and network models of projects into the overall calendar and network model of the program, control milestones are set and risk management plans are updated.

Milestones are formed according to the same concept as the project schedule, but to manage a biadaptive development program, they must be determined from the standpoint of integrating many projects to establish different stages of the program, each of which must be defined by a set of competencies.

3. The Objective and the Research problems

The objective of this article is to formulate a methodological approach to the implementation of programs of biadaptive development of the organization on the basis of cognitive improvement of key competencies of such organizations.

To achieve this goal in this article, the authors solve the following scientific problems:
- to formulate concepts and ways of key competence development of the project-oriented organizations as basis of the cognitive mechanism of ensuring success of biadaptive development programs;
- formalize the task of synchronized development of staff competencies in order to obtain cognitive synergy and improve the cognitive potential of the project-oriented organization in biadaptive development programs in the form of a dual task of linear optimization;
- to propose an approach of biadaptive cognitive improvement of team competencies management in the project-oriented organizations` biadaptive development programs.

4. Key Competence as the Basis of the Cognitive Mechanism to Ensure the Success of the Biadaptive Development Program

Until recently, the development of the theory and practice of project and program management based on innovation mechanisms went in two directions: innovation process management and innovation management as a project. Novikov showed that design and process approaches are different ways of presenting the same processes occurring in systems [8], and that, if necessary, you can move from one method of presentation to another and vice versa, which fits into the task of forming the overall competence of staff biadaptive programs development.

For successful competition in the market of the project-oriented organization it is necessary to formulate all competencies and to allocate key. The key competence of the organization is such competence, the presence of which allows the organization to solve problems that are beyond the power of most other market players, sets a new standard of activity in the industry and thus provides the owner with a competitive advantage. In the case of biadaptive development programs of project-oriented organizations, such a key competence can be formed on the basis of cognitive modeling of the target competence model.

According to G. Hamel and S.K. Prahalad [9], the company should be perceived not as a set of business units that make it up, but as a combination of key competencies - skills, abilities, technologies - that allow organizations to create certain values for their customers.

Key competence is the strategic potential of a project-oriented organization. Operational management of the organization - a way to benefit from this potential, subject to coordinated management of operational and design subsystems within the biadaptive models.

Let us formulate the signs of key competence:

- significance for consumers, their willingness to pay for competence, as for most of the value they acquire;
- ability to change and adapt to new market requirements;
- uniqueness, low probability of repetition by competitors;
- based on knowledge and cognitive models, rather than coincidence;
- connection with several types or products of the project-oriented organization;
- relevance, compliance with strategic vectors of market development and project-oriented organization;
- the possibility of partnering with internal and external stakeholders to create new key competencies;
- clarity, accessibility of the wording of competence for its unambiguous interpretation;
- creating synergies from the combination of individual competencies of specialists of the project-oriented organization in the overall competence in project management on the basis of cognitive models and methods.

With competent actions, key competence leads to the creation of unique products, provides a project-oriented organization with superiority in entering new markets and significant advantages in solving problems that will later become a field of fierce competition. In a competitive environment, organizations seek to protect key competencies in order to maintain a competitive advantage. An important factor in such preservation is the accumulation and development of competencies, the formation and use of knowledge base on project management, the use of cognitive mechanisms for its improvement.

Key competence plays a leading role in the cognitive improvement of the organization, which is implemented through biadaptive development projects (Fig. 1).

The staffing process of project teams' members included in the biadaptive development program should be based on the target configuration of competencies. Executives of development program should determine this configuration. Employees from the organizational structure of a project-oriented organization should be selected for this configuration, if the competence of employees corresponds to the set of competencies defined by the role in the development program draft.

The competencies of the development program staff are improved during the implementation of the program, as well as the key competence of the organization is improved. Thus, through the development of individual competencies in biadaptive development programs, the key competence of a project-oriented organization develops.

A forehanded understanding of key competencies opens the way for a project-oriented organization to long-term market leadership, and the leadership gained, in turn, requires a focus on key competencies.

A key competence is a higher-order competence that participates in creating the greatest consumer value, which is collective knowledge that allows to organize and manage the use of other competencies and abilities, and thus creates additional consumer value through the use of cognitive models of key competence development.

Such properties of key competence were noted by Prahalad and Hemel: "key competence has three main properties: ... first, it gives potential access to a wide range of markets; secondly, it adds significant consumer value to the final product perceived by the buyer; third, it takes a lot of money and effort to copy a competitor's key competencies." [9]. Various authors have proposed other characteristics of key competencies. To date, the following most important properties have been identified.

Key competence is characterized by complexity. It is derived from a set of resources and abilities; it is quite difficult to identify. A specific key competence can be used only within the business system in which it exists, i.e. it is unique to this configuration of resources and capabilities. Competence, unlike other assets of the organization, is not characterized by such characteristics as aging. On the contrary, a number of authors noted this as the main strategic advantage that arises in the formation of

competitive advantage based on competence, it develops, its quality increases, the efficiency of its use increases significantly - it is the most durable and long-term asset of the organization. At the same time, the key competence is unique, that is, it cannot be directly copied or used by competitors, and irreplaceable - cannot be replaced by another competence. The key competence of the organization, often from the beginning is better developed than competitors, and focused on the consumer (by definition). Finally, because a key competence includes a set of other competencies and abilities, it can be used to reinforce them.
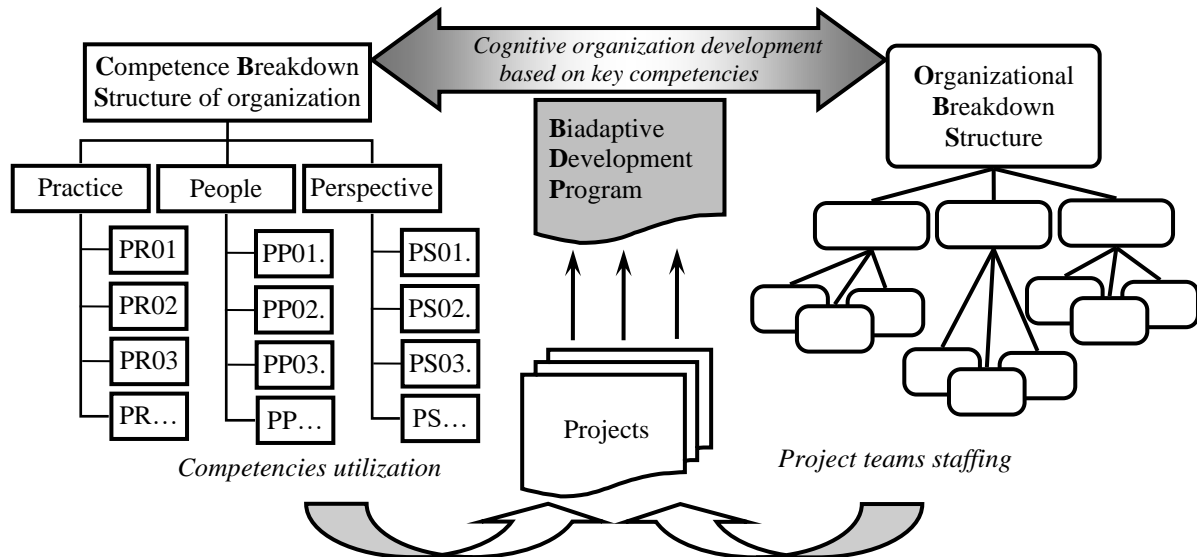

Figure.1: Biadaptive development program in organization.

The key competence lies in the intersection of internal business conditions and consumer preferences, this is the knowledge on which depends on obtaining the maximum share of consumer value. The increase in additional consumer value through the development of key competencies and is the basis for obtaining a sustainable competitive advantage. Higher consumer value of the product can be used to implement two basic types of strategies - differentiation or cost leadership. This allows us to conclude that the key competence makes it possible to obtain in the competition as a qualitative advantage related to the properties of the product, and quantitative, related to a stronger financial position. This indicates the universal nature of the key competence, which provides opportunities for its manifestation in the consumer and industrial markets.

The existing key competence of the organization may undergo significant changes when implementing a program of project-oriented organization biadaptive development. In addition, it should be understood that the implementation of innovations can give not only benefits but also additional problems and even risks. In addition, it should be noted that a project-oriented organization may have more than one key competence, especially when it comes to implementing a change in management structure, in particular through the introduction of a bi-adaptive approach.

5. Formalization of the Competence Development Task

Synchronized development of competencies in an attempt to obtain cognitive synergy and improve the cognitive potential of a project-oriented organization is a difficult task for formalization. The classical problem of linear optimization is no longer suitable for solving this class of problems, because it does not take into account the additional conditions that arise during the transition of a project-oriented organization from one state to another through the implementation of a biadaptive development program. Therefore, to solve this problem, it is proposed to use a dual problem [10].

Assume that the direct (initial) linear optimization (LO) problem is presented in a standard notation [11, 12].

Let us call the following LO problem a standard problem in the matrix form of record:

$$\mathbf{I}: \begin{array}{c} W_I = CX \to \max, \\ \Omega_I : AX \le B, \\ X \ge 0. \end{array}$$

A dual or related problem is a problem of the form in matrix form of record:

$$\mathbf{II}: \begin{array}{c} W_{II} = YB - \min, \\ \Omega_{II} : YA \ge C^T, \\ Y \ge 0. \end{array}$$

$$\mathbf{b} = B = b = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_m \end{bmatrix} = \begin{bmatrix} b_1, b_2, \ldots, b_m \end{bmatrix}^T, B \in \mathbf{R}^m$$ - coefficients of the right parts of the system of

constraints of the direct problem,

$$\mathbf{y} = Y = y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_m \end{bmatrix} = \begin{bmatrix} y_1, y_2, \ldots, y_m \end{bmatrix}^T, Y \in \mathbf{R}^m$$ - variables (unknown) values of the dual linear

optimization problem.

In this case, the matrix A of system coefficients can be represented in vector form:

$$A = \begin{bmatrix} \mathbf{a}^1 \\ \mathbf{a}^2 \\ \vdots \\ \mathbf{a}^m \end{bmatrix} = [\mathbf{a}^1, \mathbf{a}^2, \ldots, \mathbf{a}^m]^T = [\mathbf{a}_1, \mathbf{a}_2, \ldots, \mathbf{a}_n] \in \mathbf{R}^m \otimes \mathbf{R}^n$$

and a pair of dual problems has a third form of writing:

$$W_{II} = (\mathbf{b}, \mathbf{y}) \to \min,$$

$$\Omega_{II} : (\mathbf{a}^i, \mathbf{y}) \ge \mathbf{c}, \qquad \text{- a dual problem to the given line.}$$

$$\mathbf{y} \ge 0.$$

Analysis of the definition of a dual problem for a standard form of representation of a direct problem, allows to determine the necessary operations for the transition to a dual problem $\xrightarrow{\text{def Dual}}$:

- the extreme requirements of the objective functions of direct and dual problems are opposite in design:

$$W_I \to \max \xrightarrow{\text{def Dual}} W_{II} \to \min ;$$

- for the problem on the objective function present in the system of constraints inequalities must have a sign $\le$:

$$\sum_{j=1}^n a_{ij} x_j \le b_i;$$

- the coefficients of the objective function of the dual problem are components of the vector of the right parts of the system of constraints of the direct linear optimization problem;

- the matrix A^{T} of the system of constraints of the dual problem Ω_{II} is transposed to the matrix A of the system of constraints of the direct problem Ω_I

(This is true because $YA = A^T Y^T$);

- the right parts of the system of constraints of the dual problem $\Omega_{II} : (\mathbf{a}^i, \mathbf{y}) \geq \mathbf{c}$ are the coefficients of the objective function $W_I = (\mathbf{c}, \mathbf{x}) \to \max$ of the direct problem;
- each constraint-inequality of the system of constraints of the direct problem is associated with an integral double unknown:

$$\Omega_I : \sum_{j=1}^{n} a_{ij} x_j \leq b_i \xrightarrow{\ def\ \ Dual\ } y_j \geq 0, \ i = 1, \ldots, m \,;$$

- to each non-negative unknown direct problem of linear optimization, the constraint-inequality of dual is corresponded:

$$x_j \geq 0 \xrightarrow{\ def\ \ Dual\ } \Omega_{II} : \sum_{i=1}^{m} a_{ij} y_i \geq c_j, \ \ j = 1, 2, \ldots, n \,.$$

Note that the different forms of writing linear optimization problems are equivalent - they store many solutions. This can be achieved by using equivalent transformation techniques to move from one form of problem to another.

Suppose we have a general problem of linear optimization:

$$W_I = CX \to \max,$$

$$\mathbf{I}: \Omega_I : \left\{ \begin{pmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{pmatrix} \begin{pmatrix} X_1 \\ X_2 \end{pmatrix} \begin{bmatrix} \leq \\ = \end{bmatrix} \begin{pmatrix} B_1 \\ B_2 \end{pmatrix} \right.,$$

$$x_j \geq 0, \quad j = 1, 2, \ldots, l,$$

or in the expanded form of record:

$$W_I = \sum_{j=1}^{n} c_j x_j \to \max,$$

$$\mathbf{I}: \Omega_I : \begin{cases} \sum_{j=1}^{n} a_{ij} x_j \leq b_i, & i = 1, 2, 3, \ldots k, \\[2mm] \sum_{j=1}^{n} a_{ij} x_j = b_i, & i = k+1, k+2, k+3, \ldots m, \\[2mm] x_j \geq 0, & j = 1, 2, \ldots, l, \end{cases}$$

dual to it we will call the problem of the form:

$$W_{II} = YB \to min,$$

$$\mathbf{II}: \Omega_{II} : \left\{ \begin{pmatrix} Y_1 & Y_2 \end{pmatrix} \begin{pmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{pmatrix} \begin{bmatrix} \geq \\ = \end{bmatrix} \begin{pmatrix} C_1 \\ C_2 \end{pmatrix} \right.,$$

$$y_i \geq 0, \quad i = 1, 2, \ldots, k,$$

or in another form of record:

$$W_{II} = \sum_{i=1}^{m} b_i\, y_i \rightarrow \min,$$

$$II: \Omega_{II}: \begin{cases} \sum_{i=1}^{m} y_i\, a_{ij} \geq c_j, & j = 1,2,3,\ldots l, \\[2mm] \sum_{i=1}^{m} y_i\, a_{ij} = c_i, & i = l+1, l+2, l+3,\ldots n, \\[2mm] y_i \geq 0, & i = 1,2,\ldots,k. \end{cases}$$

An example of the task of optimizing the biadaptive development program and avoiding unreasonable decisions or minimizing unforeseen costs, which should be accompanied by the development of the competence of the program management team. In this case, in the formulation of the dual problem, the variables will take the following value: X – the level of competence of the members of the project management team, which is assessed expertly in accordance with the convolution of KPIs for each team member; Y – cost of project resources; A – coefficients of importance of project participants in the project management team; B – priority factors of resources in the pool of project resources. The problem can be solved by standard methods of linear programming. Thus, the task of synchronized development of competencies was formalized in order to obtain cognitive synergy and improve the cognitive potential of the project-oriented organization in the biadaptive development program.

6. Holacracy as an approach of biadaptive cognitive improvement

In modern research, holacracy is considered as one of the means of organization development, in particular through the development of project team competencies [14-16]. Holacracy can be characterized as a system of organization of management and decision-making, which are distributed between teams that are self-organizing, and not provided according to the management hierarchy. From a management point of view, the key structural elements in a holacracy are roles, not specific performers - team members (one person can perform several roles at a time). The role is determined in accordance with the possible areas (domains) of control and responsibility, the current tasks of the project team. Thus, conceptually, the team is considered in the form of a circle. Roles are defined for each "circle" by the method of collective management and are regularly corrected and improved in order to bring them in line with the needs of the organization, which are constantly changing. Thus, within the organization, teams can be represented as a system of self-organizing circles. However, to some extent, the hierarchy in the management process is maintained due to the fact that in practice the circles have a hierarchical organization. The so-called external circles set a specific goal for a certain circle and determine the areas of responsibility. In this case, each circle (team) is endowed with the authority for internal self-organization in order to effectively achieve the goals. In the case of a project-oriented organization, each circle is a project team and the external circles are stakeholders or stakeholder groups of the project. Such stakeholders can be both internal and external stakeholders in relation to the organization. Thus, the team can hold internal meetings, appoint employees to appropriate roles and determine those responsible for the work within the established area of authority. In order to coordinate actions in projects with the mission and strategy of the organization, it is necessary to provide appropriate roles (communication with management, "lead link" and communication with the subordinate, "rep link"). Team members who perform these roles participate in meetings of both their own and external circles. Consider this approach taking into account the principle of biadaptability. From a governance perspective, a team can divide development program management processes into two groups: management (project) processes and production (operational) processes. Accordingly, in the first group, in management processes, each team uses a clearly defined process of management and improvement of their own roles and principles of work. He should ensure that proposals are made for changes in the team structure and based on the consensus or consent of the program management team members. In this way, it is possible to ensure the integration of the views of all parties (team roles) on a particular issue, so that the proposed changes and objections to them are taken into account, and therefore the needs of the organization are taken into account. In the second group, production processes, team coordination is determined by production needs. Each team

member (circle) must perform responsibilities in the project (program) in order to ensure effective teamwork. In this case, the team member must have a high degree of autonomy and authority to choose effective ways to achieve goals in the project (program). In this case, the group of management processes is the main in the sense that the authority and the choice of ways to achieve goals will not lead to unforeseen spending of the organization's assets. The application of this approach in view of the improvement of the organization in a turbulent competitive environment allows us to consider its development taking into account the cognitive and biadaptive components. It is the team that self-organizes using a holacratic approach that can identify the lack of necessary competencies in the project and eliminate this shortcoming in a timely manner. At the same time, the division of processes into management and production allows the project team to apply biadaptive management in order to achieve the goal of the biadaptive development program. In programs of biadaptive development there is an improvement of competences of both project, and operational subsystem of the project-oriented organization between which mutual adaptation (bi-adaptation) is carried out (fig. 2). In this case, the cognitive component of the development program has three levels.
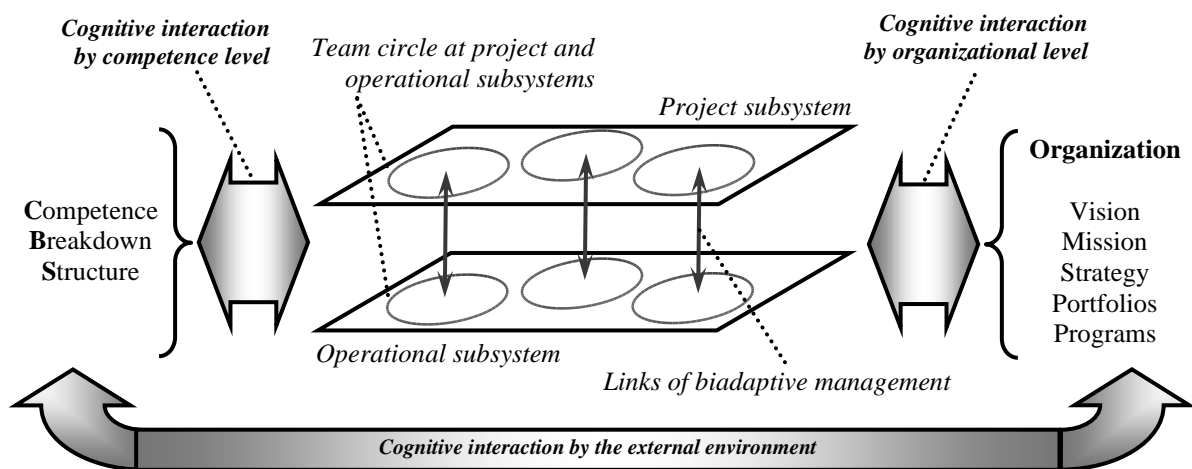

Figure 2: Biadaptive management in organizational development program.

The first level is the cognitive impact of the development program on the competence breakdown structure of the project-oriented organization, as a result of which the competencies of project team members develop. The second level - cognitive impact on the organization as a whole, its vision of development, mission strategy, principles of program, portfolio and project management. At this level, under the influence of the results of the development program can be corrected strategic vectors of project-oriented organization. The third level is the cognitive influence of the external environment on the development program of the project-oriented organization. At the same time, both the structure of competencies (the environment may require additional competencies) and the strategic vectors of the organization (for example, due to changes in market) may undergo appropriate adaptive changes. Thus, the cognitive improvement of the project-oriented organization is carried out under the influence of both internal factors (project and operational subsystem) and the influence of the external environment. In this case, the models are: halocracy, biadaptivity, foresight, competence structure.

7. Conclusion

In this article, the authors formulated a methodological approach to the implementation of programs of biadaptive development of the organization on the basis of cognitive improvement of key competencies of such organizations. The concept and ways of project-oriented organizations` key competence development as basis of the cognitive mechanism of biadaptive development programs are formulated. In particular, the concept of key competence has got further development. The key is the competence of the highest order, which participates in the creation of the greatest consumer value, which is collective knowledge that allows to organize and manage the use of other competencies and abilities, and thus create additional consumer value. In the development of existing research, a model of key competence as the basis of the cognitive mechanism to ensure the success of the such program

is proposed. It is concluded that to solve complex problems of biadaptive development programs, the use of standard methods of linear optimization is not enough, because the classical problem of linear optimization does not take into account additional conditions that arise in the transition from one state to another. For such problems it is offered to use algorithm of a double problem. The proposed formalization will help solve the problem of synchronized development of staff competencies in order to obtain cognitive synergy and improve the cognitive potential of the project-oriented organization in biadaptive development programs by solving the dual problem of linear optimization. The holacracy as an approach of biadaptive cognitive improvement is also proposed as a means of biadaptive cognitive improvement of the project team competencies in program of biadaptive development of project-oriented organization. Further research in the chosen direction may include the development of a conceptual and multiple model management program for bi-adaptive development of project-oriented organizations, formalization of algorithms for accumulation and use of knowledge in the knowledge base of project-oriented organizations concerning individual competencies, group competence and key competence.

8. References

[1] Bushuyev, S., Jaroshenko, R., Proactive Program Management for Development National Finance System in Turbulence Environment, Social and Behavioral Sciences74 (2013) 61-70.
[2] A. Bondar, S. Bushuyev, S. Onyshchenko, H. Tanaka, Entropy Paradigm of Project-Oriented Organizations Management. CEUR Workshop Proceedings 2565 (2020) 233-243.
[3] Timinsky A., Voitenko O., Chernova L., Chernova L., Influence of implementation of biadaptive management and foresite on the development of competence, Bulletin of NTU" KhPI". Series: Strategic Management vol.1, (2020), pp. 63-67. doi: 10.20998/2413-3000.2020.1.9
[4] Project management association of Japan, PMAJ, 2000. URL:http://www.pmaj.or.jp/ENG.
[5] Bushuyev, S., Verenych, O., "Organizational Maturity and Project: Program and Portfolio Success", Developing Organizational Maturity for Effective Project Management (Chapter 6: Organizational Maturity and Project: Program and Portfolio Success), p. 349 (2018).
[6] M. Odrekhivskyy, V. Pasichnyk, A. Rzheuskyi, V. Andrunyk, M. Nazaruk, O. Kunanets, D. Tabachyshyn, Problems of the intelligent virtual learning environment development. CEUR Workshop Proceedings 2386 (2019) 359–369.
[7] Bushuyev, S., Kozyr, B., Rusan, N. Modeling of Empathy, Emotional Intelligence and Transformational Leadership to the Project Success. Mathematical Modelling and Simulation of Systems. Advances in ISCB Series. Springer AG. vol. 972, P. 209-222. (2020)
[8] Novikov, D., Project management: organizational mechanisms (2007).
[9] C. Prahalad, G. Hamel, The core competence of the corporation. Harvard Business Review 68 (3) (1990) 79-91.
[10] Tytov, S. D., Chernova L. S., The general algorithm of writing couples of dual problems in linear optimization. Bulletin of ONMU. Vol.1 (54). (2018), pp. 148-157.
[11] Unger, N., Dempe S., Lineare Optimierung. Wiesbaden, Springer. (2010). 142 p.
[12] Bixby, R. E. A Brief History of Linear and Mixed-Integer Programming Computation. Documenta Mathematica, Extra Volume «Optimization Stories». (2012), pp. 107-121.
[13] Morozov, V., Kalnichenko, O., Mezentseva, O. The method of interaction modeling on basis of deep learning the neural networks in complex IT-projects. International Journal of Computing, 2020, 19(1), 88–96.
[14] V. Tomashevskyi, A. Yatsyshyn, V. Pasichnyk, N. Kunanets, A. Rzheuskyi, Data Warhouses of Hybrid Type: Features of Construction. Advances in Intelligent Systems and Computing book series 938 (2019) 325–334.
[15] R. Kaminskyi, N. Kunanets, V. Pasichnyk, A. Rzheuskyi, A. Khudyi, Recovery gaps in experimental data. CEUR Workshop Proceedings 2136 (2018) 108–118.
[16] R. Kaminskyi, N. Kunanets, A. Rzheuskyi, A. Khudyi, Methods of statistical research for information managers, in: Proceedings of the 13th International Scientific and Technical Conference on Computer Sciences and Information Technologies, CSIT 2018, 2018, pp. 127-131.