CROSS-FUNCTIONAL FLEXIBLE TEAMS IN SUSTAINABLE PROJECT MANAGEMENT

Svetlana Apenko – Mikhail Romanenko

Abstract

In the development of sustainable project management, the task of forming a project team that is able to provide the criteria for sustainability is relevant and needs to be addressed. Flexible cross-functional commands are best for this purpose. The purpose of the research is to substantiate the set of competencies of a flexible cross-functional team of a sustainable project and to form these competencies. The research methods were functional analysis of the activity of sustainable project teams and expert survey of project managers. Functional analysis of activity was carried out in 16 project teams of 12 enterprises, 155 managers and specialists of project teams from different Russian enterprises participated in the expert survey. Models of competencies that provide both classical project management functions and team functions are proposed. Relationships between the availability of certain competencies and the team's performance in sustainable project management are established. The main directions of the formation of these competencies through project communications, formation of project culture and project thinking, and formation of skills for sustainable project management are defined. The novelty is represented by a set of competence models that have no analogues in scientific publications and methods of their formation in the system of sustainable project management.

Key words: project, flexible teams, cross-functional teams, sustainability.

JEL Code: M12, M54, O15

Introduction

The concept of sustainability has become a leading ideology and practice in the world economy in recent decades. It is the subject of research that reveals the essence of the criteria for sustainable development, their assessment and methods of achievement (Pislaru,

Herghiligiu, Robu, 2019; Carayannis, Grigoroudis, Sindakis, 2014). There are significantly fewer studies that adapt the concept of sustainability to project management (Seidel, Thamhain, 2001; Silvius, Kampinga, Paniagua, Mooi, 2017; Carboni, Duncan, Gonzalez, Milsom, Young, 2018). Our research develops the idea of sustainable project management. We define a sustainable project as a project aimed at achieving a balance of economic, social and environmental sustainability criteria in the current period of time and in the long term for future generations of people. Such a project needs to be managed in a special way.

The issues of sustainability in project activities are raised by researchers, but such a direction as a special type of team for sustainable projects has not been studied. Questions about what functions and tasks are performed by teams of sustainable projects, what competencies teams should have, how to form these competencies, and how the presence or absence of competencies can affect the results of a sustainable project are open for discussion.

Our research provides an explanation of the answers to these questions. For this purpose, a synthesis of scientific research in the field of professional competencies, project management and project competencies is used. It is based on the interpretation of the competence of the classics of the competence approach in human resource management (Spenser, 2010). Competence is a set of knowledge, skills, abilities, motivation, and personal qualities that are demonstrated in the behavior of employees and allow them to perform work at the required level.

The research is based on the research of scientists on the project management methodology, professional competencies of the project Manager and performers (Schropfer, Tax, Kurul, 2017; Larson, 2013; Obradovica, Cicvaric, Mitrovica, 2016). The following statement is taken: the quality of human resources is important for the success of the project, and to ensure this quality, professional management of the project team is required. Professional standards on project management are devoted to the description of project managers' competencies. These competencies are considered to be classic and current for all projects.

Due to the increasing degree of uncertainty and unpredictability of the project environment, a flexible approach to project management has become particularly popular (Boral, 2016; Khalil, Fernandez, Houy, 2013; Gong, 2013; Cohn, 2011). The hypothesis tested in our study is that sustainable projects require flexible teams and flexible management. We borrow a description of the specifics of the flexible project team.

1 Concepts used in the study

Based on the approaches available in the scientific literature and developing them, we have formulated concepts that are used in research and represent scientific novelty (definitions of these concepts are not available in science).

A flexible project team is a team that in a short time and at minimal cost, without stopping project work, is able to use its potential and available resources to switch to new working conditions, to produce a modified innovative product or service, and to master new technologies of project work under the influence of environmental factors dynamics. The main feature of a flexible team is cross-functionality, that is, the ability to quickly and efficiently switch to combining many functions and project roles, implement interchangeability within the team, learn new functions and flexibly adapt them to the existing structure of functions.

Flexible professional competencies are a set of knowledge, skills, abilities, motivation, values, and personal qualities of the project team's human resources that can be easily and quickly adapted to external conditions, developed, combined, and rebuilt in their structure.

The hypothesis confirmed by the research is that the team must be flexible and cross-functional to achieve the sustainability criteria.

2 Research Methodology

The purpose of the research is to substantiate the set of competencies of a flexible cross-functional team of a sustainable project and methods for forming these competencies. In accordance with the goal the following research questions are formulated:

What competencies should the members of a flexible cross-functional sustainable project team have based on their functions and work?

Is there a relationship between the presence of a set of specific competencies of a flexible cross-functional team and the effectiveness of a sustainable project?

What methods can be used to develop the required competencies of a flexible cross-functional team for a sustainable project?

The object of research is the teams involved in the implementation of sustainable project management functions, that is, in planning, organizing, monitoring, coordinating project work, managing time parameters, budget, quality, risks and communications.

2.1 Method of functional analysis of activity

Functional analysis of activities involves an in-depth study of the functions and tasks performed by the sustainable project team. For this purpose, the first stage uses the method of included observation, in particular, photos of working time, and the second stage uses the method of expert assessments of the functional activities of the project team. The method of working time photography consists in recording specific actions of the project team members and the duration of their execution in special forms throughout the working day. For a photo selected the typical working days when the team performs project work. The representativeness of the data is ensured by a large number of observations and compliance with the criteria for selecting the observed project teams.

To confirm the data obtained using the working day photography method, the second stage additionally uses the method of expert evaluations of typical functions of the sustainable project team. The method was a standardized interview of an expert.

Functional analysis of activities was carried out in 16 teams of sustainable projects of 12 enterprises in Omsk. The selection of enterprises was based on the criteria for implementing the sustainability policy in project activities. The sample includes enterprises in the petrochemical and chemical, machine-building, construction, and consulting industries. For the study, we selected teams that implement business projects with the sustainability requirement in mind: maintaining a balance of economic, social, and environmental sustainability criteria in the current period and in the long term. Teams have the number of employees: up to 10 people -40%, from 11 to 20 people-35%, from 21 to 30 people-25%. Teams with a large number of people were not studied due to the complexity of working time photography in multiple teams.

Experts were selected from the 16 teams selected for the study, as well as other teams from 12 enterprises. The task of experts was to confirm or refute the importance and typicality are included in the results of the previous stage features and tasks of the team of the sustainable project, if necessary, to supplement this list; to create a list of the most popular and significant results for any sustainable project, regardless of its size, type, industry. The criteria for selecting experts were: experience in sustainable projects of at least 2 years, experience in any projects of at least 4 years. According to these criteria, 52 project managers and specialists from 12 Omsk enterprises were selected and acted as experts.

2.2 The method of expert survey

The expert survey method is aimed at substantiating the model of competencies of the sustainable project team required for the qualitative performance of those functions and tasks that were identified by the functional analysis of the activities of these teams. This method is also used to justify the answers about the relationship between the presence of a set of certain competencies of a flexible cross-functional team and the effectiveness of a sustainable project, as well as possible methods of forming competencies. The method was an online questionnaire.

Using this method, 155 project managers and specialists from 12 Omsk enterprises previously surveyed by the functional analysis method, as well as 24 enterprises in Russian cities – Moscow, Yekaterinburg, Tyumen, and Novosibirsk – were involved in the study. The expansion of the regions' composition was necessary to increase the representativeness of the research results. Representativeness is also ensured by careful selection of enterprises and experts. Criteria for selecting enterprises: implementation of sustainable projects in the last 4-6 years. Criteria for selecting experts: experience in sustainable projects of at least 2 years, experience in any projects of at least 4 years. Since not many enterprises in Russia are yet turning to sustainable project management, the sample of enterprises and experts used in the study may be considered sufficient. The study was conducted in the period 2019-2020.

3 Research Results

3.1 Functions and tasks of a team working in a sustainable project

The study conducted using revealed a set of typical and frequently implemented functions and tasks (table 1). At the same time, we have recorded that these functions are performed regardless of the size of the project, its type or industry orientation. Team members implement the classic functions of managing the project's subject area, its time parameters, and cost, but their share is not large. The project's focus on meeting sustainability requirements encourages the team to perform appropriate tasks to achieve a balance of economic, environmental, and social criteria in short and long (strategic) planning horizons. These functions and tasks are listed in table 1 as numbers 2-6. The study allowed us to record functions and tasks (numbers 7-10), which indicate the importance of constant adaptation of the project and its team to changing environmental factors. This causes flexible working methods in the project with the corresponding formation of cross-functional flexible teams. The share of communication increases significantly: agreements, meetings, resolving contradictions, building relationships with different stakeholders.

Tab. 1: Set of typical functions and tasks of a sustainable project team

№	Typical functions and tasks of a sustainable project team	The percentage of time for completing a function and task in the working day time budget (%)
1	Managing project activities, deadlines, budget, and product creation	20
2	Managing both economic, social and environmental risks	12
3	Managing the quality of project results in terms of balancing economic, social and environmental requirements	10
4	Working with stakeholders to coordinate interests and overcome contradictions and conflicts	8
5	Work with managers and specialists of the enterprise to coordinate the project with measures of social and environmental responsibility of the business	5
6	Participation in communications on strategic issues of your project and other enterprise projects	5
7	Control of the project's external environment factors, adjusting the project to changes in the external environment	10
8	Making adjustments to plans due to the dynamics of stakeholders' requirements for current and future results	6
9	Project meetings	12
10	Performing work in project microgroups with temporary changes in the project role and functionality	12

Source: compiled by the author.

The survey of experts confirmed the significance and prevalence of the functions and tasks of the sustainable project team included in the list.

3.2 Competence model of a cross-functional flexible sustainable project team

In accordance with the established functions and tasks of the sustainable project team, a list of competencies was compiled. Then, using a survey of experts, the degree of need for certain competencies is determined. The analysis of the received information allowed us to develop a competence model for a cross-functional flexible team of a sustainable project, which consists of the following groups of competencies.

Group 1: competencies of classical project management functions:

- the abilities and skills of management subject area project;
- skills in managing project time parameters;
- project cost management skills;
- ability to manage project changes.

Group 2: competencies of sustainable project management functions:

- skills in planning, monitoring and achieving environmental, social and economic sustainability indicators;
- ability to manage simultaneously economic, social and environmental risks of the project;
- thinking focused on achieving a balance of economic, social and environmental effects;
- ability to quickly take into account the dynamic interests of different stakeholders, negotiation skills to coordinate the interests of different groups of project stakeholders;
- ability to manage the project in the context of corporate environmental and social responsibility of the business;
- strategic thinking focused on achieving long-term effects.

Group 3: competencies of flexible project management functions:

- ability to combine different functions, be interchangeable team members, exchange project roles and project functions;
- ability to adapt their competencies to the dynamic factors of the project environment in a timely and high-quality manner;
- skills of operational analysis of changes in environmental factors and accounting for the results of analysis in making decisions on changes in the project;
- ability to work with the customer to Refine the vision of the result, adjust the project implementation process to meet the changing requirements of the customer;
- ability to flexibly change and adjust project plans;
- communication skills-conduct team meetings, exchange information during the project, negotiate, build partnerships, identify the needs of stakeholders and build a communication strategy with them.

3.3 Relationship between the availability of certain competencies and the effectiveness of the team in sustainable project management

Table 2 provides answers to the question about which competence groups affect the project success rate. Based on the F-criterion, we can conclude that the greatest relationship is observed between success rates and the competencies of sustainable and flexible project management.

Tab. 2: Answers to the question "which groups of competencies affect the success rate of the project?" (in %)

Indicators of success of the project	Classical management competencies			Sustainable management competencies			Flexible management competencies			F-criterion	Significance (p)
	yes	partially	no	yes	partially	no	yes	partially	no		
compliance with the terms of the project	80	16	4	6	20	74	15	12	73	37,078	,000
achieving results within the project budget	78	18	4	12	34	54	16	14	70	27,507	,000
achieving economic, social and environmental effects	14	12	74	52	26	22	17	14	69	14,800	,000
getting long-lasting effects	16	18	66	47	35	18	13	22	65	15,273	,000
customer satisfaction, long-term partnerships	15	17	68	46	28	26	41	29	30	6,395	,002
the satisfaction of the project team	13	28	59	50	22	28	67	21	12	8,136	,001

Source: compiled by the author.

Note: points were calculated based on percentages, where the answer is "Yes" - 2 points, "partially" - 1 point, "no" – 0 points. We checked the presence of statistically significant differences in the Fischer criterion using the formula:

$$F - criterion = \frac{\text{intergroup average square}}{\text{intra - group average square}}$$

3.4 Methods of forming cross-functional flexible team competencies

The following methods are considered by experts to be the most effective for forming competencies that are important for the success of sustainable projects.

Firstly, involving team members in strategic sessions, working groups on forming a policy of social and environmental responsibility of business, providing conditions for participation in collective decision-making on minimizing social and environmental risks of projects.

Secondly, the role-building of the project team and creating conditions for the project team members to combine different roles, replace each other in the role functionality, and master new project roles.

Third, the development of effective communication practices within the project team, such as systematic project meetings, organizing a retrospective analysis of the project progress, organizing sessions with different project stakeholders, and others.

5 Discussion of research results

The research allowed us to prove the hypothesis that it is important for a sustainable project team to develop not only classical project competencies, but also competencies for performing the functions of sustainable and flexible project management. The relationship between the availability of certain competencies of a flexible cross-functional team and the effectiveness of a sustainable project is established. In accordance with the built model of competencies, methods of their formation are identified.

The results of this research contribute to the development of the following scientific concepts:

- concepts of sustainable project management, offering evidence-based answers to questions about what a sustainable project team should be and how to form it. In particular, we have developed the ideas of the authors Pislaru, Herghiligiu, Robu talk about the

importance of project sustainability, but do not show how to achieve it with the help of certain team competencies;

- the concept of flexible project management, offering a new interpretation of the flexible team and its competencies, continuing to develop the ideas of authors such as Boral, Gong that flexible management requires special competencies.

An additional value of the study is to combine these two concepts and obtain a synergistic effect as a result.

Conclusion

The research allowed us to substantiate the model of team competencies based on the identified functions and tasks implemented in a sustainable project. Dependencies between the availability of competencies and the performance indicators of a sustainable project are established. The role of cross-functionality and flexibility of the team as a factor of project performance is proved. The main directions of competence formation through project communications, team building, formation of project culture and project thinking, formation of skills for sustainable project management are defined.

References

Pislaru, M., Herghiligiu, I. V., & Robu, I.-B. (2019). Corporate sustainable performance assessment based on fuzzy logic. *Journal of cleaner production, 223*. 998-1013.

Carayannis, E.G., Grigoroudis, E., Sindakis, S. et al. (2014). Business Model Innovation as Antecedent of Sustainable Enterprise Excellence and Resilience. *J Knowl Econ 5*, 440–463. https://doi.org/10.1007/s13132-014-0206-7

Seidel, E., Thamhain, H.J. (2001). Managing environmental quality at the enterprise: the role of project management. *Environmental Engineering and Policy 3*, 19–32 https://doi.org/10.1007/s100220100040

Silvius, A. G., Kampinga, M., Paniagua, S., & Mooi, H. (2017). Considering sustainability in project management decision making; An investigation using Q-methodology. *International Journal of Project Management. 35(6).* 1133-1150.

Carboni, J., Duncan W., Gonzalez, M., Milsom P., Young M. (2018). *Sustainable Project Management: The GPM Reference Guide.* Novi, MI: GPM Global.

Spenser, L. M. Competence at work. L. M. Spenser, S. M. Spenser. M.: Hippo, 2010. Pp. 205-221.

Schröpfer, V. L. M., Tah, J., & Kurul, E. (2017). Mapping the knowledge flow in sustainable construction project teams using social network analysis. *Engineering, Construction and Architectural Management. 24(2).* 229-259.

Larson, E. (2013). Project Management: textbook: Transl. from English fifth, full. ed. Eric W. Larson, Clifford F. Gray. *Moscow: Publishing House "Business and Service"*. 784 p.

Obradovica V., Cicvaric Kostica S., Mitrovica Z. (2016). Rethinking project management - Did we miss marketing management? *Procedure-Social and Behavioral Sciences. No. 226.* P. 390-397. P. 392.
Boral, S. (2016). Domain I Continued: Agile Methodologies. In: Ace the PMI-ACP® exam. *Apress, Berkeley, CA*
Khalil, C., Fernandez, V., Houy, T. (2013). Can Agile Collaboration Practices Enhance Knowledge Creation between Cross-Functional Teams? In: Benghozi PJ., Krob D., Rowe F. (eds) *Digital Enterprise Design and Management. Advances in Intelligent Systems and Computing, vol 205*. Springer, Berlin, Heidelberg
Gong Y. (2013). Cross-Function Global Operational Practice. In: Global Operations Strategy. Springer Texts in Business and Economics. Springer, Berlin, Heidelberg
Cohn, M. (2011). Scrum: Flexible Software Development = Succeeding with Agile: Software Development Using Scrum *(Addison-Wesley Signature Series). Moscow: "Williams".* P. 576.

Contact

Svetlana Apenko

Dostoevsky Omsk State University

RF, 644077, Omsk, Mira pr-t, 55a

apenkosn@yandex.ru

Mikhail Romanenko

Dostoevsky Omsk State University

RF, 644077, Omsk, Mira pr-t, 55a

mihail.romanenko@gmail.com