



THE CRITICAL FACTORS FOR PROJECT TEAM COLLABORATION IN DEVELOPING NEW PRODUCTS: QUALITATIVE PERSPECTIVE

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Abstract

Human factor is the biggest challenge to project success and results. New product development (hereinafter NPD) projects require not only different competencies from different fields, but collaborative approach as well. Collaboration in project management is considered as one of the most important factors allowing to reach project's success (Hansen M.T. et al., 2006). The paper deals with the factors determining an efficient collaboration of teams developing new products. The analysis of the scientific literature reveals three levels of critical factors of collaboration: organizational, team and individual. However, this paper is focused on theoretical and empirical analysis of organizational and team level factors of collaboration by employing qualitative research approach (focus group, and content analysis). A list of critical factors for project team collaboration in developing new products has been developed on the basis of team performance success theoretical findings. As a result of the content analysis, categories and sub – categories of collaboration factors have been revealed.

Key words: *collaboration, new product development projects, team, factors.*

JEL code: *O15, M12*

Introduction

Dynamically and rapidly changing environment, perfection of technologies, development of innovations, and, herewith, changing needs of clients raise new challenges to business. These reasons are conditioning organizations' need to improve products' quality, to tackle related problems more efficiently and to improve activity results (Edmondson E.C. et al., 2009). Successfully developed new products become one of the most important factors that create business competitiveness, and the human factor is a presumption for development of successful new products. In development of new products there are often used methodologies and tools of project management (Rolstadås A. et al., 2014). It is noticed in scientific literature that properly formed and managed team of new product development allows to reach better results and more successful products (Hirunyawipada T. et al., 2010; Hirunyawipada T. et al., 2015). A topic of new products development is analysed in scientific literature widely enough: Bstieler L. et al. (2003) analysed an effect of environmental uncertainty on process activities, project team characteristics, and new product success; Dayan M. et al. (2009) analysed antecedents and consequences of team reflexivity in new product development projects; Islam et al., (2009) analysed the relationship between team learning and top management support; Holtzman Y. et al. (2011) analysed a role of diversified teams in development of new products, Martinuso M. et al. (2013) analysed the organizational impact of product development projects; Parkinson C. (2006), Son J.W. et al. (2011) analysed teams' collaboration as organization's strategical necessity. Abundance of scientific studies that analyse factors of new product development success indicates the interest of academic society and importance of the problem, however role and factors of team collaboration in new product development still remains researched poorly



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

enough. In scientific literature, a topic of collaboration in projects is analysed by distinguishing levels of both organization, and team and individual. In other words, we can distinguish three categories of factors positively or negatively affecting teams' collaboration. Hence, we distinguish the factors of organization, team and individual levels. Further in this article we will analyse the factors of project teams' collaboration at organization and team levels only.

The goal of the article is to examine the factors determining an efficient collaboration of teams developing new products.

Literature review

Collaboration. Collaboration concept is used to describe the organizational relationship. Collaboration concept is often used intuitively or as a synonym to coordination, cooperation, communication and partnership (Atkinson J. et al. 2004; Brown K. et al. 2003; Hara N. et al. 2003). Many different descriptions of the collaboration concept can be found in scientific literature. Son J.W. et al. (2011); Parkinson C. (2006); Patel H. et al. (2011) describe collaboration as a reciprocal process when two or more persons or organizations work together. A presumption can be made that participants of this process have common goals. Persons that participate in the process are taking higher benefit by collaborating when they share their experience and knowledge, than when working separately. Calantone R. et.al (2011) and Kahn K.B. (1996) in collaboration concept highlight a reciprocal understanding, common vision, common goals and sharing resources between divisions. Patel H. et al. (2011) state that collaborating persons have a sense they are doing good job together, and ask for advice of each other. Gibson C.B. et.al (2003) highlights common efforts in striving for a common goal, and Kahn K.B. (1996) highlights an emotional process. Again, Deutch M. (1949) developed a theory of collaboration and competitiveness, which compares the work of persons in a competitive environment, when persons are working together, and in a competitive environment, when persons are working independently and competing with each other. Collaboration and competitiveness relationship are analysed through dimensions of communication, interrelationship, work distribution, valuables, responsibility, knowledge and skills as well as interests. In the theory, collaboration is in contrast to competitiveness; positive influence of collaboration on team activity and its results are highlighted, and in contrary in case of influence of competitiveness. The positive influence of collaboration creates an effect of synergy and makes presumptions for the team's productivity (Johnson D.W., 1979).

Collaboration in project management is considered as one of the most important factors influencing the project's success (Hansen M.T. et al., 2006). Due to inter-sharing of knowledge and experience, successfully collaborating project teams can reach an increase of benefit, decrease of input, more efficient process of problems tackling and shorter period of the project's implementation.

New product development team. Project Management Institute, PMBOK (2013) describes project's team as project manager and group of persons that are working together in striving for implementation of project goals. New product' development *project team* is a group of persons, the goal of which is to work together by implementing new products development projects that require knowledge, abilities, experience in different areas, and in striving for successful implementation of the project (Brown K. et al., 1995; Shen X., 2002). Project Management Institute, PMBOK (2013) describes project's team as project's manager and group of persons that are working together in striving for implementation of project's goals. New



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

products' development *projects team* is a group of persons, goal of which is to work together by implementing new products' development projects that require knowledge, abilities, experience in different areas, and in striving for successful implementation of the project (Wynstra F. et al., 2001; Shen X., 2002; Burford L.D., 2013). Teams consist of persons with different knowledge and skills are also being called diversified or heterogeneous teams of NPD (Holtzman Y. et al. 2011). Diversified teams differ from the usual team by the fact that every person of the team is a specialist of different area with certain knowledge, competencies required to develop a particular project (e.g. research-development, marketing, production and other) (Hackman J.R., et., 2010).

Factors determining project team collaboration. In scientific literature, a topic of collaboration in project is analysed by distinguishing levels of both organization, and team and individual. In other words, we can distinguish three categories of factors positively or negatively influencing projects team collaboration. Hence, we distinguish factors of levels of organization, team and individual. Further in this article we will analyse the factors of project teams' collaboration at organization and team level only.

Organizational culture, structure, processes and involvement of team members in processes can be attributed to the factors of organizational level. Team's vision and goals, conflict management, communication, team learning and motivation can be attributed to the factors of team level.

Organizational culture. Organizations in striving for own strategic goals are following the provisions and system of valuables established in the organization. Organizational culture positively affects collaboration, trust, and reciprocal accountability, higher levels of initiative and proactivity among team members (Furst S. et al., 1999). Organizational culture results in a high level of shared leadership perception, which, in turn, causes high proactive behaviour by team members. Moreover, Erkutlu H. (2012) investigated that organizational culture, moderated the positive relationship between shared leadership and proactive behaviour. Development of organizational culture is one of manager's activities, allowing to form an environment of mutual trust and respect in which employers' value their team membership (Paul J. et al., 2001; Avolio B.J. et al., 2004); inspire and motivate teams to perform at their best (Shamir B. et al., 1993). Jones S. (1996) highlights two priorities of the point of view oriented towards people that is based on the main collaboration provisions and skills: long term, agreement, collaboration, learning relationship with employees, suppliers and users; investment in training, research and development, equipment. Culture, valuables, principles allow to reach desirable results if they are clearly communicated in the organization, supported by an organization's management (PMBOK, 2013; Shen X. 2002; Hershock R.J. et al., 1994; Burford L.D., 2013). Management support and clear agreements and standards are strong motivations for teams' collaboration (Kumar T., 2005; Holtzman Y. et al., 2011). If organization's management does not estimates NPD team properly, gives different priorities and responsibilities to team members, there appear collaboration barriers (Griffin *et.al*, 1996). In point of view of project management, discontentment in organizational culture is the main reason causing failures of project management (Besta A. et al., 2013).

Organizational structure. NPD teams have to collaborate with organization's different internal divisions, different project teams, and supply chain partners. Strict hierarchic structure is considered as one of the barriers for efficient team work. It often determines limited information flows. Flexible, transparent and interactive hierarchy of organizational structure



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

motivates team to strive for results by collaboration of different functional groups (Hershock R.J. *et.al.*, 1994; Holtzman Y. *et al.*, 2011).

Organization's processes and team members' involvement into them. Well-structured process of new product development with clearly described integrated activities and importance and role of every functional group as well as involvement of team members into the processes is a base for successful collaboration of project team (Ahmed C.S., 2000; Ulrich K.T. *et al.*, 2008). Consistent and concerted technology, optimally evaluated need for resources and schedule, eliminated overlapped activities and responsibly planned works not only create presumptions of successful collaboration but also decrease a probability of mistakes, develop better understanding of responsibilities, well-run work. Besides, having strengthening a dimension of collaboration, team's inter-integration can be improved, period of product development process shortened (Ahmed C.S., 2000; Schilling M. *et.al.*, 1998). In order to ensure collaboration, it is very important that members of product development team would be responsible for the whole process of product development, and not for the part of it (Strazdas R. *et al.*, 2010; Holtzman Y. *et al.*, 2011). Product development teams with higher integration while analysing needs of users, generating and analysing new ideas, developing new products according to market needs, analysing users' requirements or revising results of market testing usually are collaborating successfully (Griffin A. *et.al.*, 1996).

Goals and vision. Diversified NPD teams have a lot of potential in the implementation of successful projects. However, they also are the teams that are difficult to manage successfully (Dreu C.K. *et al.*, 2003; Pelled L.H., 1996). The ability of all team members to name and understand project's goals directs them towards purposeful work and allows to combine them to personal goals. Project goals enable team members to determine what actions are suitable or unsuitable for project implementation. Clear goals and formed vision are related to better activity results and strategy development at both individual and team levels (Lynn G.S. *et al.*, 2001). However, hidden and vague goals negatively affect collaboration (Pun, P.K., 2007). Knowing of vision allows understanding of the totality of projects' goals, priorities and relationship with the organization. Holtzman Y. (2011) states that understanding of goals is not enough. In striving for better results, the team has to be committed also. If knowing of the goal allows people to know direction of activity, then commitment is what motivates the team to work and strive for results. Besides, commitment shows ownership of the goal and mutual accountability. Presentation and positioning of goal and vision is an underlying activity of project manager (Schilling M. *et.al.*, 1998).

Complex nature of NPD projects together with strict costs of product development and time limitations inevitably stimulates *conflicts* in the team, and management of these conflicts becomes very sophisticated (Song X.M. *et. al.*, 1997). Conflicts have different influence at different stages of the project (Hsieh T. *et.al.*, 2008): Ideas of new products generated at the stage of *initiation* require for coordination of different point of views and experiences, proposal of new ideas. Conflicts between team members at the stage of initiation are useful and allow estimating different opinions, analysing different information and so on. However, emotional conflicts disturb sharing of information between team members and negatively affect team collaboration at the primary stage of NPD. At the stage of implementation, there is a striving for /realising of chosen product concept. Conflicts that appear at this stage, without reference to tasks, or emotional ones, disturb team's collaboration.



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

Another essential competence of any team manager is the ability to create a *qualitative communication* and information flow in the team (Holtzman Y. et al. 2011). In modern collaborating team, members communicate often (Brown S.L., *et. al.*, 1995), openly and honestly (Mountfort J.M.P., 1997). Clear and often communication of team manager and members become very important (PMBOK, 2013). Knowledge should be shared within all functional groups because successful collaboration requires knowledge integration between members of NPD project teams. Team members by interacting and spreading information in projects of new products development decrease probability of indetermination and stimulate collaboration (Zahay D. *et. al.*, 2011).

By scientific researches it was proved (Lynn G.S. *et.al.*, 2003), that *team's learning* is a corporate activity based on knowledge development and sharing, by involving collection, interpretation of information in striving to implement team's and organization's tasks. NPD projects require for a wide spectrum of knowledge integration and collaboration between team members. Ability to learn is considered as another factor of collaboration (Holtzman Y. et al., 2011), which allows to learn from each other, create the totality of different knowledge and competencies (Brown S.L., *et. Al.*, 1995). Rapidly learning NPD project teams collaborate more successfully: they develop and introduce into market new products more rapidly and with a higher probability of product success (Lynn G.S. *et.al.*, 2003).

Product development team and manager have to be well *motivated* to develop successful product (Strazas R. *et.al.*, 2010). Collaboration and commitment of team members are strengthened by obtaining benefits and assessment. Because different persons are being stimulated by different things, it is useful for a team manager to strive to know those motivations of team members (Holtzman Y. et al., 2011). Motivation of team members is being increased by system of product innovations' proposals when employees can give their ideas for coming of new product. Success of team collaboration is positively influenced by innovation friendly environment that is developed in organization, toleration of risk, free working time given to employees for development of their ideas (Strazdas R. *et.al.*, 2010). Besides, team manager has to strive for development of the atmosphere that stimulates creativity and involvement of team members (Mountfort J.M.P., 1997).



Methodology

The 1 figure illustrates the logical sequence of this research; the dashed rectangle embeds the scope of research which results are presented in this paper. The empirical research aimed at exploring the critical factors for the effective project team collaboration. This paper deals with the results of focus group only, the qualitative research will be conducted in the near future and after having generated the main aspects of this phenomenon to prepare the questionnaire for the quantitative research.

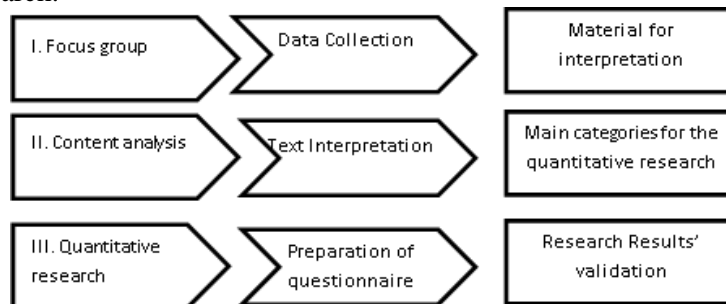


Fig. 1. **Research framework**

Source: Authors' construction

Data collection method. The focus group was chosen as the data collection method. This method has widely been adopted in practice, especially in health, market and social research (Liamputtong P., 2011). Its distinct feature is interview of group of respondent. The distinct between structured and less structured focus group research is usually discussed, the first type needs for more involvement of moderator and the manner of the focus group is more to answer a particular question, while in the other type – less structured focus group - the discussion in the group is essential (Liamputtong P., 2011).

Following the main research question (what are the critical factors for the new product project team collaboration), the discussion questions were prepared for the participants of the focus group. The focus group consists of 9 project managers from different types of sector (service sector, manufactory and beverage industry). The main criteria for the participant were as follows: experienced (no less than 5 years) project manager in new product development projects.

In this paper the less structured focus group technique is presented as the main data collection method. Thus the main topic questions for the focus group discussion have been elaborated and are as follows: perception of collaboration in project teams; driving factors of collaboration in the project team, the role of organizational culture and structure in project team collaboration.

Data interpretation method. Text is a transcript of focus group records. In order to make an in-depth interpretation an analytical technique - the qualitative content analysis has been employed. The essence of content analysis – interpret text with caution to maintain/preserve the important message coded in the text. Mainly content analysis is classified as qualitative and quantitative (Hsieh T. et al., 2005; Mayring Ph., 2000).

This method is widely used in a various scope of sciences, for example, health and social sciences. The three different approaches are identified in content analysis: directed, conventional, and summative. The differences among them lie in the coding system, origins of



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

codes, and threats to trustworthiness (Hsieh T. et al., 2005). For instance, categories in conventional content analysis are derived directly from the text data. A directed content analysis approach begins with the theory analysis and the research findings are prerequisite for initial codes. During a summative content analysis counting and comparisons of keywords are central issue (Hsieh T. et al., 2005). In this paper the conventional content analysis is employed. The categories were carefully founded and revised within the process of analysis.

Results

Having analysed the interview material the following results were extracted and divided in to subsections.

Project team collaboration categories. The interview with experts has revealed that during the new project initiation and implementation the individuals from different departments are engaged. Therefore the focus for the need of collaboration and integration of several of competences and skills within the team was argued in the focus group (“New product development team includes people from different departments, therefore it is important to align different expectations. For example, if you are talking about the quality department, production, marketing department, all people, have their own expectations and has their own desires.”). And usually the collaboration in the project team embeds such features like members’ involvement, contribution and others (see table 1).

Common view category means that every team member equally perceives the target and expected result (“We need to be sure that talking about the same thing. Our ultimate goal must be equally understood by all team members, e.g. other specialists.”).

Table 1

The features of collaboration, in new product development team

Category	Sub-category
Involvement	<i>Involvement in the project</i>
Contribution	<i>Contribution to the project results</i>
Clear idea	<i>Explicitly transferring idea to the rest of team member</i>
Effective communication	<i>Effective communication [among team members]</i>
Common view	<i>Common understanding of final result for each team member</i>
	<i>Common target</i>
Respect to individual expectations	<i>Aligning different expectations</i>
	<i>Identifying individual expectations</i>

Source: author’s summary based on the interview with experts

To sum up the categories extracted during the content analysis regarding the perception of collaboration is concordant with the main idea of communal in the theoretical discourse (Calantone et.al, 2011; Gibson et.al, 2003; Roger et.al, 2005). The communal refers to *Common understanding of final result for each team member* and *Common target* (see table 1). And moreover the team member involvement, the effective communication, contribution to the project results, pursue for a common goal and clear idea, meaning „to be on the same page“ are essential features for describing collaboration in new product development project team.

Factors for the project team collaboration. The results have indicated that “Team leader features” is the core factor for the project team collaboration in new product development team,



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

according to the discussion in the focus group the essential features embeds: proactivity, open to innovation, capable to moderate, communicate with the team members and also open to innovation (see table 2).

Table 2

The factors for the effective project team collaboration in new product development team

Category	Sub-category
Team members' engagement	Product team member engagement
	Individual willingness to contribute to the project results
	Integrating of each member's competences
Team leader's features	The influence of team leader to the collaboration
	Very proactive
	Interested
	Open to innovation
	Listen to other team members
	Moderator
	Effective conflict management
Effective communication	Effective communication [among team members]
	Rules of communication
	Periodically assessments and meetings
	Timely corrections (if needed)
	Explicit plan for processes
Organizational culture	Friendly environment/surrounding
	Formation of intercommunion
	The way of behaviour
	Organization values
	Mutual collaboration
Organization's leadership role/ organisational structure	Organization's leadership approach to cooperation
	Enhancement of collaboration
	Tolerance towards well-founded risk
	Support in critical situations
	Open leadership
	Democracy structure

Source: author's summary based on the content analysis

The content analysis revealed that organization culture is one of the project team collaboration factors. To illustrate "Culture is an important for collaboration, because it forms the mutual cooperation relations, the way we work, we treat each other". Not forgetting the values of organization like tradition, culture and responsibility.

The results illustrate that the leadership of the organization influences the collaboration in the project team significantly in terms of formation of organizational culture, communication of values, both internally and externally and supporting of troubled projects.



Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

Conclusions

The content analysis of focus group has revealed that that organization culture is one of the project team collaboration factors and it embeds such sub-categories like *Friendly environment/surrounding; Formation of intercommunion; The way of behaviour; Organization value; and Mutual collaboration.*

Moreover the role of Organization's leadership also has appeared to have the influential impact on the collaboration within project team, and it refers to such sub categories like *Organization's leadership approach to cooperation; Enhancement collaborate; Tolerance towards well-founded risk; Support in critical situations; Open leadership and Democracy structure.*

Following the research framework presented above the quantitative research will take place in the near future, which will integrate the categories and sub categories extracted within this research scope, not forgetting the psychological dimension like conformism and stigmatism as the barriers for the effective collaboration.

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Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

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Project Management Development – Practice and Perspectives

Fifth International Scientific Conference on Project Management in the Baltic Countries

April 14-15, 2016, Riga, University of Latvia

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Project Management Development – Practice and Perspectives

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