

Optimisation of Multidisciplinary Collaboration in Fast-Paced Innovation Projects

Niya Stoimenova

Supervisors: ir. Lenny van Onselen and Dr. ir. Rianne C. Valkenburg

The Hague University of Applied Sciences

niya.stoimenova@gmail.com

ABSTRACT

This paper discusses four factors that influence the initial stages of development of a multidisciplinary team: 'clarity', 'trust', 'conflict' and 'personal values'. They were uncovered after an empirical study and action research were carried out during projects using a fast-paced collaborative innovation approach in one of the largest electronics firms in the world. In such context collaboration poses multiple challenges to the successful project outcome. Therefore, facilitators need guidance how to optimize the collaboration in the context of the approach.

Keywords: multidisciplinary collaboration, trust, clarity, conflict, personal values, innovation

INTRODUCTION

The research studied one of the largest electronics companies in the world. Focused in the areas of healthcare, consumer lifestyle and lighting, this firm uses multidisciplinary collaboration in its daily practice. The projects using a fast-paced collaborative innovation approach are especially difficult. Developed and facilitated by the design department of the firm, these projects are carried out in multiple iterative loops of a day to a week. Prototypes and value propositions are created early in the New Product Development process. The major challenge is the collaboration between culturally and professionally diverse people who have pre-fixed ideas of how the project should be executed.

LITERATURE AND THEORY

The question guiding the literature review was: 'what are the factors that influence and drive multidisciplinary collaboration?'. Many examples and success formulas can be found in the literature. Some studies point at external factors for the team like professionally stimulating and challenging work environments, clearly defined authority relations, project visibility and popularity [1], opportunity for accomplishments and recognition [2] and maturity of the project team [3].

Others focus on internal team factors such as establishing clear team goals, tasks, purpose, mission, plans, core norms of behaviour and communication [1]. Job skills and expertise of the team members appropriate for the project work are also important [2]. Team members who have worked successfully together in the past [2] should be considered as well as the overall directions and team leadership [3]. Last but not least, several studies have demonstrated the role of interpersonal trust, respect, and credibility among team members and their leaders as a moderator of effective teams and successful projects [4][5].

In addition, the collaboration is influenced by team members' personal networks and integrity [6], sufficient time to map the expertise of others [6] and personal values [7].

Barriers that hinder team collaboration such as unresolved conflict, self-censorship [4], groupthink [7] and differences in language and jargon [8] have to be taken into consideration, too.

The literature review helped in defining a solid base of factors to look for during the empirical study. It also provided better understanding of the different influences on team dynamics in similar to the researched contexts. Last but not least, it contributed to a more specific research question: 'what are the critical success factors for creating optimal conditions for multidisciplinary collaboration during fast-paced collaborative projects in the researched firm?'.

DATA AND METHODS

A participatory action research and twelve retrospective interviews were conducted mainly with participants and facilitators of the observed projects. The research was applied with the means of fly on the wall and participant observations [9] within four collaborative projects. All of them used the researched approach, had different duration, stage of team development and facilitators.

The results were collected in daily journal entries and detailed transcriptions of each interview. The initially gained insights were clarified and confirmed by the subsequent interviews and observations as well as by further in-depth literature study. An action research followed in order to narrow down the scope to the critical factors that influence the initial stages of team development.

RESULTS

The factors uncovered during the literature review and the empirical study were placed together in a framework. Categorized in five different clusters, it served as a starting point in the design of a solution. The factors added to the literature by the empirical study can be found in Table 1.

Before	During	After	Barriers	Context
Clear hypothesis	Clear rules, scope and methodology	Clear results	Limited availability	Clear context
Pre-selected teams	Externalization of ideas(prototypes, drawings)	Consolidation of new learning	Non-structured process	Enthusiastic business owner
Initially briefed team	Ongoing dialogue		Pre-fixed ideas	
Personality fit	Fun		Tight time frame	
Concept-level thinking	Constant activity updates		Distraction	

Table 1: Factors uncovered during the participatory action research

Based on the framework and a brainstorm session with

stakeholders, two design concepts were developed. After several iterations, the input of different stakeholders and evaluation matrices, a concept for a mobile application was selected. The app gives facilitators of the approach

access to a database of methods that are already successfully applied in this context. Each one of them addresses and helps in dealing with one or two factors from the previously discussed framework. The concept's desirability and usability was tested by several facilitators with different levels of experience with the approach. One of the most frequently received feedbacks was that they consider giving a good start to a project to be the most difficult part.

As a result, the concept transformed into a mobile social platform where facilitators can share their experience, add and review methods and learn from each other. The app also gives them an option to create a personal profile (Figure 1) through which case studies can be added to the platform as well. In addition, it communicates the framework's factors, but pays attention to the ones crucial for the initial stages of team development by giving daily tips. This feature is also used to communicate the fundamental values and beliefs guiding the approach.

In order to identify factors that can help in creating a solid base for a successful collaboration, an in-depth literature study was carried out. The uncovered factors were cross-referenced with the collected observation notes and the transcribed interviews. As a result four factors emerged. The first one is 'clarity' of expectations, communication and team goals. 'Clarity' can stimulate better cooperation and ensure team members' confidence in the direction of the project [9]. The second factor is 'trust', seen as a moderator of effective teams and successful projects [5]. 'Conflict' should also be considered as it is likely to have a role in the decision making process [10]. Last but not least, attention has to be paid to the 'personal values', the bridge between the other three factors, as they define attitudes and norms that guide team members' behaviour [4]. Furthermore, teams with shared values benefit from less conflict [7] and improved team performance [3].

CLARITY

"...It's like building a house and everyone brings piece so you have to have a clear idea of how to contribute"

"Never enter a project without knowing what is in the scope and what is out of it: are we going to think about potatoes and bananas or only bananas"

During the empirical study 'clarity' was the most frequently discussed and observed reason for both the success of a workshop and its failure.

For instance, in one of the observed workshops the level of initial obscurity was so high that it eventually led to the workshop's failure. Four designers with different areas of expertise and experience were invited as an addition to an already existing technical development team. They had



Figure 1: Facilitator's personal profile

never worked together before and no one knew what the others are good at. Neither the goal of their participation nor the expected deliverables were clearly communicated to them. The facilitator repeatedly tried to come up with a clear task, but this only led to more confusion. In the end their work was not used further in the project.

TRUST

“If I should rate the factors that determine good collaboration, trust would be the most important one”

“I can say that building trust starts with “are you trustworthy or not” or at least, can you give somebody the feeling that you are.”

The importance of trust was frequently mentioned and its presence or lack was observed in every workshop. One of them was quite unusual as people ended up volunteering their time to work on it. The project was later in its development and the team dynamics were in a more matured phase. The majority of the members are Dutch and hold a degree in a design discipline, although working for different departments. There was mutual trust between the members. They have known each other for a few months and there were no obstacles for clear communication. When one of the designers unexpectedly brought numerous materials and proposed to turn the sketches into tangible models, the facilitator and the team went along without hesitation.

CONFLICT

“I once had to work with a person that was truly horrible... I personally know about colleagues that moved to the other hemisphere in order not to work with him”

During the participatory research two forms of conflict were observed: process and task conflict [10]. Strong process conflict was observed in only one of the workshops. It arose after a team of twenty people was divided in three professionally homogenous groups. Each of the teams, except the design one, had been given a clear explanation of their tasks. During the second day of the workshop, the facilitator tried to clarify the designers' role. While doing this, new requirements for the other two teams came up. As a result, a conflict between one of the teams and the facilitator arose. This was followed by a conflict between the facilitator and one of the designers. The facilitator tried to resolve the conflicts as quickly as possible by giving the design team a new task. However, this did not help the team to gain the needed clarity.

Task conflict was observed in a two-day workshop. On the second day, a new person joined the team as a substitute of one of the members. He was not completely aware of the scope of the project and kept proposing things that were different than the already defined direction. This led to a mild conflict between him and the

business owner. The facilitator and the project lead immediately reacted trying to explain the scope of the project but also to hear out the new-comer's ideas. This led to new ideas, proving to be beneficial to the team performance.

PERSONAL VALUES

“... you know, we have different cultures so sometimes their attitude might be quite rude for me.”

“The business person looks at different things than the engineer, frames it differently, tells it differently, and it helps if the facilitator does something to make people aware of that.”

“...because building empathy is a key design competence... we are well-equipped to take the role of the bridge between all of the different teams.”

The previously discussed workshop in which task conflict occurred was interesting in another way. The differences in the communication styles and values of some members were easily noticeable there.

During the first day the team dynamics were smooth as the team were carefully selected before the workshop. They were involved in the topic directly or indirectly for a long time and had a positive attitude towards it. Furthermore, they all had experiences with similar workshops and most of them were Dutch. In addition, the workshop's goal was communicated regularly before and during the workshop.

When the new team member from the research department of the firm joined, the difference between his and the business owner's communication styles was obvious. While the business owner looked at the big picture, the new-comer was talking about the details. This led to a minor task conflict. However, the facilitator and the project lead, together with the entire team, immediately addressed the problem and tried to find a solution.

DISCUSSION

The obstacles and challenges of multidisciplinary collaboration are well studied and documented in the literature. During the researched projects, however, these issues become more specific and the facilitators need guidance to deal with them. Although the initially derived framework can provide such guidance, the action research showed that attention has to be paid to the four factors mentioned above. They are tightly connected to the first two stages of team development [11] and can provide a solid base for a successful project outcome.

During the stage of forming groups initially concern themselves with identifying the boundaries of the task and the approach to be used in dealing with it. The importance

of clarity here is crucial as its lack can prevent the team from accomplishing the task at hand [9].

The second phase, storming, is characterized by conflict and polarization around interpersonal issues. Only by dealing with the conflict the team can continue to work successfully together. Furthermore, the existence of interpersonal trust provides the foundation for unfiltered debates [12] and therefore the easier and faster resolution of a conflict.

In addition, the team performance is directly influenced by the personal values of each team member [4]. They are the ones to provide the foundation for building trust, a common goal and organized processes in relatively early stages of team interaction [11].

Although the participatory research lacks diversity due to its short time span, constant reflection and cross-reference between the different methods was used. Furthermore, all of the observed projects were at different stages of team development. This allowed a broader overview of the possible influences. The overview was enriched by ten out of the twelve interviews during which the researched approach was deliberately compared to other multidisciplinary approaches that the interviewees had experience with. This created better understanding of the processes that occur during such projects. In addition, some of the facilitators were interviewed twice in order to clarify the raised concerns and reach a deeper level of understanding. However, further in-depth investigation of the significance and a possible hierarchical relationship between each of the four factors in this and other similar contexts is necessary. Other factors that aid the solid base creation of a project should be explored as well.

REFERENCES:

[1] Thamhain, H. J. (2012). Leadership Effectiveness in Global Project Teams. Bentley University, Waltham, MA - USA.
[2] Webber, S. S. (2002). Leadership and Trust Facilitating Cross-Functional Team Success. *The Journal of Management Development*, 21(3/4), 201-211.
[3] Hackman, J. R. (2002). Leading teams: Setting the stage for great performances. Harvard Business School Press
[4] Kets De Vries, M. F. (1997). High Performance Teams: Lesson from the Pygmies. INSEAD Working Paper Series, 3-25.
[5] Burke, C. S., Sims, D. E., Lazzara, E. H., & Salas, E. (2007). Trust in leadership: A multi-level review and integration. *Leadership Quart.*, 18, 606-632.
[6] Ancona, D., Bresman, H., & Caldwell, D. (2009). Six Steps to Leading High-Performing X-Teams. *Science Direct*, 38(3), 217-223.[7] Adair, W., Hideg, I., & Spence, J. I. (2013). The Culturally Intelligent Team: The Impact of Team Cultural Intelligence and Cultural Heterogeneity on Team Shared Values. *Journal of Cross-Cultural Psychology*, 44, 941 - 963.

CONCLUSION

The initially derived framework can provide guidance how to deal with the collaboration's challenges, but it is rather complex. Focusing on the discussed four factors will be more pragmatic. They have influence on the initial stages of team development and therefore offer the facilitators a clear and apprehensible way of creating a solid base for effective and efficient multidisciplinary collaboration. Together with the designed app they can help facilitators give an optimal start and navigate through the difficulties such collaborations present.

In conclusion, the carried out research showed that these factors have a direct implication on the way fast-paced collaborative projects in the researched firm are facilitated. Furthermore, although stemming from a research done in this context, they are firmly based on existing literature and the interviewees' experience with other approaches. As such they can be an invaluable guidance and a starting point for investigation of multidisciplinary collaboration in other innovation approaches with a similar setting.

ROLE OF THE STUDENT

Niya Stoimenova was a Bachelor's student working under the supervision of Lenny van Onselen and Rianne Valkenburg when the research reported in this paper was performed. The empirical and action research were carried out entirely by the student including the briefly discussed design concept. This research has already been used as a base of the paper: "Four Guiding Factors for Facilitators of Multidisciplinary Collaboration" presented at the PIN-C conference in May, 2015[13].

[8] O'Daniel, M., & Rosenstein, A. H. (2008). Patient Safety and Quality: An Evidence-Based Handbook for Nurses, Chapter 33. Rockville.

[9] Blessing, L. T., & Chakrabarti, A. (2009). *DRM, a design research methodology*. Springer.

[10] Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, 40, 256-282.

[11] Tuckman, B. (1965). Developmental Sequence in Small Groups. *Psychological Bulletin*, 384-399.

[12] Lencioni, P. (2002). *The Five Dysfunctions of a Team - A Leadership Fable*, page 185. San Francisco, CA: Jossey-Bass.

[13] Stoimenova, Onselen and Valkenburg (2015). Four Guiding Factors for Facilitators of Multidisciplinary Collaboration. In: Valkenburg R, C. Dekkers and J. Sluijs: Reframing Design. Proceedings of the 4th Participatory Innovation Conference 2015. The Hague, 18-20 may 2015. ISBN: 978-90-73077-66-9.