# Product-development efficiency in cross-functional teams

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Abstract. This paper reports the results from two companies in which cross-functional product development projects were followed during two years. The main purpose of the study was to analyze the evolution of the interaction in cross functional teams. Results showed that; ' - 1) Team interaction can be enhanced if a team-oriented and powerful project manager is chosen. 2) Interaction is a learning process, time for reflection is necessary. 3) Organizational learning can be accomplished through transfer of people between projects.

During the last decade/ it has been intensively discussed how to improve product development (PD). Speed-to market has become a highly competitive issue due to shorter product lifecycles and fluctual market demands (Hayes & Wheelwrigth, 1988). Inspired by the success reported in trend setting research reports (Trygg, 1992) in which large, top performing corporations have adopted the "Concurrent Engineering" (CE) concept, many smaller engineering companies are trying to do likewise in order to increase their competitive advantage. Communication, collaboration, problem solving and integration are enhanced since cross-functional teams,with a strong project manager are used, often termed 'Heavyweight project manager" is used (Trygg, 1992). Several studies, have shown that the use of CFT and a strong PM, are most important for reducing lead-time and integrating personnel - One of these studies (Trygg, 1992) also showed that not all CE projects necessarily performed better :- troll! budget and commercial success. This inconsistency may be accounted for, by the fact that "human factors" were neglected.

## Theoretical frame of reference

### Organizations that enhance team-based work

When analyzing the success of projects, researchers tend to look at them as isolated units/ without considering the organizational context in which they exist. Corporate culture and structure can be more or less "project mature" (Rapp Ricciardi, 2001). The attitude of the top-level management can either support or hinder the success of ongoing projects. Mohrman et. AI (9) asserts that organizations must be redesigned with a new logic, since a traditional, hierarchical organization impairs the possibility to work effectively with teams. The goal awareness must be spread throughout the whole organization. Integration should be done horizontally (within the organizational level), as well as vertically (between the hierarchical levels).

### Organizing projects that enhances team-work

Projects are commonly defined as undertakings with specific starting and ending points, in which objectives are clearly established. Packendorff (1994) makes a distinction between "project organization" and "project organizing". Project organization regards the study of planning, controlling and evaluating projects while project organizing is concerned with conceptions/ actions and learning within the project. The bulk of the literature seems to be focused on "project organization" and not much have been written about the psychological contract between the members within the project, or between the members of the project and their surroundings. It seems logical however, that the project organization (the structure) should have an effect on the psychological status of the project members. Three different project organizations are usually referred to: The functional project organization "- the matrix organization or the project organization (Boddy, 1998) In case A, work is led by the respective line managers. In case Band C the control of the resources are divided between the project manager (PM) and the functional manager. If the PM has much power and high status within the organization as in case C, h is referred to as a HWPM. In case D the project members have been pulled out of their respective functions, and the project is conducted by a strong project manager one can assume that integration is enhanced, since CFT-members are formally assigned and dedicated to the project team.

### Team vs. work groups

CFT's are claimed to be one of the most effective ways to achieve integration among the company function. (Katzenback & Smith in Boddy, 2002). But what is a team and how is it supposed to work? Is there any difference between a tearn and a work group? Donellon (1988) defines a team as a group of people who must accomplish a task that requires continuous integration as a group of people who must accomplish a task that requires continuous

integration of knowledge, skill and experience. What distinguishes a team from a work group is the larger number of different competencies who requires constant interaction and mutual adjustment to one another in order to accomplish the joint task. Katzenbach and Smith 1992, define five different teams: The working group, the pseudo team! the potential team, the real team, and the high performance team. The major difference between them lies in the extent of integration and motivation among the team members. The real team and the high performance team are defined as: "a small number of people with complementary skills who are equally committed to c purpose, goals, and working approach for which they hold themselves mutually accountable". In the high-performance team, team-members are more committed to their task. These examples illustrate that the definition is not clear. What is clear/ is that if the ambition is to work in a cross-functional way, energy must be invested m creating good team integration.

### The project manager

The project management literature has a tendency to generalize the project manager (PM) role. Since there are different kinds of projects, one would expect that different kinds of PM's would be needed. Normally the PM is defined as a person who takes responsibility for planning, implementing and completing a project. While the functional manager usually uses the analytic approach that focuses on breaking the components of a system into smaller elements, it seems that a PM should preferably be a generalist than a specialist and thereby use the system approach. Briner et. AI (1991) claims that the PM has different roles, and as a consequence should work in different directions. The PM should have good contact with the project mentor, who is his superior (Upward). Projects usually have an established goal and a final customer (Outward). Backward and forward directions calls for a good control system that makes sure that one can learn from mistakes and achieve the established goals. The PM is responsible for team performance, both the collective as well as the individual (Downward). It is important that the PM continuously reflects on his own behaviour since it is of great importance to the project output (Inward). It seems that the Up- and outward directions have to do with the PM's political skills. Backward and forward have to do with the ability to use different methods. Downward and inward have to do with the PM's psychological skills. With regard to the last mentioned directions literature is insufficient. Considering the context in which a PM works, one would assume that his leadership style would be goal oriented, as well as team oriented. Another trait that could be considered important is flexibility.

## Purpose of study

Two of the most important factors behind the reduction of lead-time, and integration of functions were considered to be the use of cross-functional teams, in combination. With a strong PM. Research has also shown that if consideration is not given to Human factors, it could lead to inferior results. It should therefore be of interest to analyze how companies deal with these matters. The purpose of this study was to analyze how two team-members described the PM's ability to interact with the CFT and the surrounding.

## Method

### Procedure

Data was collected along the PO process in one company, here labelled Ada. The companies have approximately 700-800 employees. The majority of its products are exported and are considered to be of high quality. The company have lately suffered from increased competition which has forced them to become more effective. The research methods included interviews. Data were collected during a product development project. Respondents included key persons who participated in project (2 members of the cross-functional teams), and who were originally from different departments. Totally 4 interviews were conducted with 2 persons.

## Result

#### Case Ada

##### Interaction in the CFT

According to the two interviewed team-members (hereafter IP:s), the majority of the CFT-members were acquainted with each other in a project organizational context, since they had worked together in a similar project before. The earlier project had been success in terms of time, cost and quality and the members seemed to be quite confident with them. However the company had had difficulties creating good integration and interaction between different departments. Although these conflicts easily arose between the departments they did not exist to any great extent in this project. The climate in the team was reported to be very positive. The CFT-members respected each other and felt they were experts who contributed to the project Marketing department representative was experienced as an "outsider", probably due to the fact that hp was located in another building, which made informal meetings difficult. The fact that other CFT -members had offices close to each other was considered to be a factor of major importance.

##### Evolution of interaction

Stress increased as the project proceeded, but the PM demonstrated no signs of irritation, according to the IP:s. He let the team-members work at their own pace, trusting that they would do their best. He seemed to have good control over his temper. Although he did his best a solve problems in a diplomatic way, irritation increased. This was due to the fact that he was not able to solve a conflict that arose with a person indirectly connected to the project. The PM tried to separate the conflicting parties instead of making them communicate. At this time CFT-members reported that the PM had got tougher in his confrontations with the top- 4 level management regarding project resources, but that they had been taken from the project anyway. Some of the CFT-members felt more skeptical about reaching the established goals. They also expressed suspicions that valuable information probably was withheld from the top-level management. A feeling of "them" vs. "us" developed, where the enemy of the project was the top-level management who was not able to understand the importance of continuous project support. Project delays were sometimes attributed to continuous changes in product specifications. Another interesting aspect that surfaced was the fact that the CPT –members had different educational levels and different conceptions of time. Market could easily make changes in the product specification, not understanding how much time-consuming, sometimes unnecessary re-work which created minor misunderstandings. Most of the negative statements were related to the hard time-pressure that at this time was experienced as being absurd. Despite the hard pressure, team-work continued to function well. No departmental rivalry was noticed. The group climate was still dominated by the positive feeling of being a team. Most CFT-members felt that collaborating and communicating was the best possible way to reach the tough goal that had been set up.

##### Success of failure?

Ada was successful in accomplishing the quality, time, and cost objectives that had been set in the beginning of the project. This was achieved with a combination of skill and luck according to the CFT-members. Even if there had been glimpses of irritation when stress increased, no major technical- or collaboration problems had been reported.

##### Perception of working in cross-functional PO-projects

Working with strict time-focus and a CFT led by a dedicated PM, was mainly positively experienced. Considering the high pressure the team was exposed to, there were few conflicts reported. On the contrary, the majority reported that collaboration and communication was considerably better in this project than in the ordinary PO organization. It was also argued however, that there should be a de-programming phase after such a tough project. The CFT-members argued that it would be of value to document the experiences in order to accomplish individual as well as project organizational learning. CFT-members had also been flattered by the attention given by the top-level management, and the rest of the organization, but complained about the fact that priority had not been consistent over time.

## Discussion and conclusion

Ada had been successful in its branch, but was now losing market shares. The company decided to use new forms for PO, including elements from the CE concept such as time-focus, cross-functional teams led by a strong project manager. It would be easy to declare Ada as a "success case, but would this be fair? It is true that Ada's top level management paved the way for their project. The selection of the CFT-members and the PM was done carefully. The "pure" project organization used is likely to create good integration. The core of the team had been welded together in an earlier project and during a kick of. And finally, the importance of the project was signalled throughout the organization, motivating CFT-members and underlining the importance of the projects autonomy. Using Mohrmans et. als model, toplevel management initially did much to accomplish vertical, as well as horizontal integration. Unfortunately, they were not consistent in keeping this strategy constant. Project management was an important factor behind the integration at Ada and he allowed collaboration and communication, occur openly. This indicates that his employee- and change oriented, project leadership worked out well. Power is certainly an important factor, and not exercising it, could create problems, which was exemplified in Ada when the PM made discussions with the strategic management in order to maintain the projects on the right track. However it should be noted that power was used principally upward, for defending the projects resources from other managers, not downwards, for controlling CFT-members.

The level of stress in the project was considered to high and the cross-functional integration impaired by this fact. The managerial implication would be to allow the CFT-members to work with less time pressure for a defined period of time and since most of the complaints regarded the time factor. Ada had been successful twice with their concept, and there is a risk that top-level management, might be tempted to do "more-of-the same", that is trying to increase project effectiveness at the expense of the project efficiency. It is important to stress the necessity to train the CFT over time. Creating effective CFT is a process rather than a one time task. Competencies, as well as mutual understanding for different conceptions of reality (such as time), must be synchronized. Top-level management must give the teams a chance to develop, and encourage them to spread their experiences throughout the organization. Perhaps a "cloning" strategy could be used, dividing one CFT in two, continuously integrating new team-members, and gradually rendering the organization more team oriented. This would also provide transfer of knowledge through transfer of people, thus serving as a mechanism for learning between projects. Developing products in cross-functional teams requires, not only careful consideration by the top-level management when selecting team members and PM's, but also a long term integration plan between the project goals and the organizational goal.

Reference

(Use Harvard style)

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