Leading a Virtual Team:

Globalization and IT Project Management

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LEADING A VIRTUAL TEAM: GLOBALISATION AND IT PROJECT MANAGEMENT

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Abstract

When implementing software development in a global environment, a popular strategy is the establishment of virtual teams. The objective of this paper is to examine what competence an IT project manager has to have to lead a virtual IT team successfully. The question is approached from the perspective of competences presented in the IPMA competence baseline, or The Eye of Competences. Results from research, as well as a survey conducted, highlighted that both soft and hard skills are needed for the optimal IT project manager to lead a virtual team. To be successful in this area it is not sufficient to be outstanding in technical competences. Soft skills like communication, teamwork and leadership are no less essential. The competences scoring highest in the survey were: clarity of objectives, leadership & project management, communication, reliability & efficiency, teamwork and quality management.

1. Introduction

In recent years, companies have increasingly turned to virtual teams as a means of connecting and engaging geographically dispersed workers, lowering the costs associated with global collaboration, and enabling greater speed and adaptability. Virtual teams have the strong advantage of gathering the best people for a specific task independent of their geographical location in a sort of 'just in time talent' approach.

The software industry is no exception. It has been impacted by globalization and this trend continues today (Lamersdorf, Münch, & Rombach, 2009) (Conchúir, Holmström, Ågerfalk, & Fitzgerald, 2008). These changes have been coupled with the availability, in large numbers, of qualified software engineers located in low cost economies, who are capable and willing to undertake outsourced and offshore software development (Toaff, 2002).

Virtual teams, while offering many benefits, also pose a number of challenges. One of these challenges is to develop effective global leaders.

In this changing environment, what competence has an IT project manager to excel in to be able to take on these challenges? What soft and hard skills do they have to focus on?

In this paper the above mentioned question are approached from the perspective of competences presented in the IPMA competence baseline, or *The Eye of Competences*. This study, however, only focuses on the technical and behavioural categories, leaving the contextual category untouched.

Background of the author

The author is a computer scientist (BS degree from the Reykjavík University 2001) and has worked in software development from 2000. From the year 2009, the author has worked as a project manager on an international project with a distributed team, primarily the development team in Sofia, Bulgaria

1. Literature Review

From around the millennium an impressive amount of literature about virtual teams has been published. In the beginning, the primary focus was on technology and processes: the thinking was mainly that if you got the right technology and the right processes in place, the team would automatically perform (Duarte & Snyder, 2001). But with time followed the realization that more factors came into play in the development of high performing virtual teams and the focus shifted to team-work as well as management in virtual teams (Willmore, 2003). In recent years the emphasis has mainly been on developing and leading effective virtual teams and dealing with culture differences (Goodbody, 2005).

For the purpose of this paper, the definition from Piccoli, Powell, & Ives (2004) is used. To quote their words: ''We define virtual teams as groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organization tasks''.

1.1. Distributed/virtual project teams

In the IPMA competence baseline ICB 3.0 (2006), a team is defined as a "group of people who work together to realize specific objectives." However, it does not define virtual teams separately. The IPMA Eye of Competence is divided in three categories listed here below.

Behavioural Competences:
Leadership, engagement and motivation, self-control, assertiveness, relaxation, openness, creativity, results of orientation, efficiency, consultation, negotiation, conflict and crisis, reliability, value appreciation, and ethics.

Technical Competences:
Project management success, interested parties, project requirements and objectives, risk and opportunity, quality, project organization, teamwork, problem resolution, project structures, scope and deliverables, time and project phases, resources, cost and finance, procurement and contracts, changes, control and reports, information and documentation, communication, start-up, and closeout.

Contextual Competences :
Project orientation, program orientation, portfolio orientation, project program and portfolio implementation, permanent organization, business, systems products and technology, personnel management, health, security, safety and environment, finance, and legal.

PMBOK states that: "Virtual teams can be defined as a group of people with a shared goal who fulfil their roles with little or no time spent meeting face to face " (A Guide to the Project Management Body of Knowlwdge PMBOK Guide fourth Edition, 2008).

Many other definitions exist for distributed/virtual teams. Most of these define distributed teams as teams where the bulk of the communication is done with the aid of information technology. Lipnack and Stamps (1997) define distributed teams as groups which work across space, time and organizations, and where communication is through information technology. Some define distributed teams as those who never meet whilst others define them as teams which meet very rarely (Maznevski & Chudoba, 2000). Some scholars also differentiate between globally distributed teams and those who work within the borders of one country. Typical problems in globally distributed teams may be different from those in teams who work within the same borders, i.e. language problems, different cultural backgrounds and large distances (Binder, 2007).

Global virtual teams are different from intra-national virtual teams in that they are not only separated by time and space, but differ in national, cultural, and linguistic attributes. According to Wheatley and Wilemon (1999), a global team is defined as a team that is comprised of individuals located in many different countries or geographic areas. Team members differ in their functionality, which adds complexity to the group dynamics. The main idea behind this concept is that people are both geographically and functionally dispersed. Conversely, traditional teams consist of people that work collaboratively, but usually these are located in one location and may or may not be functionally different. In global virtual teams, the barriers can be larger because of national differences (Zakaria, Amelinckx, & Wilemon, 2004).

Dispersed teams offer various opportunities but they are also fraught with danger. These teams are often put together without the members knowing each other. They need to break through a communication barrier often created by the fact that the team members

rarely or never meet. They are often manned with individuals from many different countries and therefore with very varied cultural backgrounds, which can create considerable problems.

Although the effective use of electronic communication and collaboration technologies is vital to the success of a virtual team, virtual teams entail much more than technology and computers. When virtual teams and their leaders are asked about successes and failures, they rarely mention technology as a primary reason for either. (Kimball, 1997).

1.2. Virtual team leaders

The challenges that virtual team leaders face are immense. Many report that they feel as if they are the "glue" that holds their teams together. They have to establish trust in an environment with little or no face-to-face contact or feedback. These challenges necessitate the development of an additional set of competencies that complement the skills for leading traditional teams. (Egeland, 2010).

Ingason and Jónasson (2009) argue that the project manager should have hard skills and technical skills as well as soft skills like those that relate to leadership, motivation, group dynamics, interpersonal communication, culture, and ethics, to manage the project effectively. Further, soft skills will help in managing people from diverse cultures and managing conflicts among the team-members. Finally, they prove that although technical ability is an important skill for the project manager, a strong focus should be given to leadership strategy and skills.

The challenges faced by virtual managers are different from their non-virtual counterparts because they must deal with feelings of isolation as well as communication difficulties. Trust, a critical factor for effective virtual working, is harder to build, while technology is both an aid and barrier to effective communication. Psychological ssues around cultural diversity emerge as virtual workers become distanced from their organisation. (Smith & Sinclair, 2003).

The outcome from Smith and Sinclair's (2003) survey confirmed that communications, building and maintaining trust, selecting the right people, developing the team and an outcome-based approach to performance management are all important for effective virtual work processes. Of these, communication and trust were most critical with effective virtual managers excelling in these areas.

1.3. Leading IT projects/software development and globalization

IT technologies change at a rapid pace and the IT project manager can rarely be expected to learn the technical aspects. However, an IT project manager must have the ability to recruit and form the team to manage the project. He should have effective leadership ability i.e. vision and the ability to influence both the stakeholders and the project team.

There is a distinct difference between an IT and non-IT project like engineering, construction, manufacturing, etc. An IT project is never standardized and comprises a variety of activities defined as follows:

1) IT development is very rapid. As a consequence, any prediction of IT projects and technologies are quite difficult.
2) There is no yardstick or standard to measure the economic viability of IT projects and activities (Schwalbe, 2007).

During the 90s, the trend was for software companies to outsource software development to a third party or subsidiaries based in Ireland, Israel, and India (Ashish & Gambardella, 2005). In recent years, however, the focus has shifted away from Ireland and Israel to Eastern Europe, Latin America, and the Far East, where China and India are the most popular locations (Geer, 2006). The number of organizations globalizing their information systems development continues to rise (Herbsleb J. , 2007). This means that globally distributed software development is set to continue to have a significant impact on the way the software industry operates for the foreseeable future.

Due to the level of complexity involved in information systems development, outsourcing or offshoring have both proved to be not such straightforward tasks. (Herbsleb J. , 2001). Some of the difficulties encountered include such factors as the problem of understanding requirements, testing of systems, and the coordination of these types of projects (Toaff, 2002). These difficulties are compounded by cultural and linguistic differences, lack of communication, and geographical and temporal distance. These are further compounded by limited visibility, lack of cooperation, different process maturity levels, tools, standards, and different levels of experience. As a result, the management of globally distributed information systems development projects is now recognized as a difficult and complex endeavour (Ebert, Alcatel, & De Neve, 2001).

Technical skills alone are not sufficient for the success of any IT project in today's distributed and complex workplace. IT projects are dispersed all over the globe and now the project manager must acquire the soft skills and leadership ability to lead the project in order to achieve the measurable organizational objectives. (Joseph, Ang, Chang, & Slaughter, 2010).

Research on critical success factors in IT project management by Thite (1999) focuses on the importance of non-technical factors, such as leadership. He describes the three dimensions, i.e. the self, the subordinate and superior perspective of successful leadership characteristics in IT project management. He argues that leadership is tangible and characterized by organizational catalysts, intellectual stimulation, behavioural charisma and contingent reward behaviours for enhanced leadership effectiveness.

2. Methodology and the survey

The purpose of the survey was to try to discover what competence IT project managers have to have to lead a virtual team successfully, e.g. what type of hard and soft skills are needed. The guidelines for competence are taken from the IPMA Eye of Competence, i.e. the technical and behavioural sectors. However, the contextual was not included.

2.1. Survey approach.

The approach used was to conduct an online survey among employees in an IT company that bases its operation on dispersed/virtual groups. The company Hugvit, or GoPro as known in international markets, is an 18 year old software company with about 70 employees located in Denmark, the UK, Germany, Bulgaria, Estonia, Slovenia and Iceland, where its headquarters are located. (Dadason, 2011)

Potential weaknesses of quantitative research include choosing the wrong sample, which can result in incorrect results as well as the design of questions; nothing can be changed after the questionnaire has been sent out, unlike qualitative studies where questions can be customized after the investigation begins (Fowler, 2002).

Measurement errors in surveys can occur for various reasons, such as for lack of motivation or understanding, or because respondents deliberately do not answer correctly. Measurement errors can be attributed to problems in the survey itself, for example, if the question is poorly worded, or by technical defects (Couper, 2000).
Fowler (2002) emphasizes that the questions must be properly designed, so that everyone understands them in the same intended manner and that individuals are asked questions they know the answers to and are willing to answer the questions.

How was the online survey designed?

The questionnaire was divided into three parts. The first part focused on background information, such as gender, experience with international projects and international training. Most of the questions in this section were traditional background questions, but to maintain anonymity it was necessary to limit this section.
In the second part, questions were asked about the last project that the individual participated in and included questions like the role in the team, team size, the number of organizations in the project, the number of locations and the maximum time difference between locations, frequency of communication, communication media, implementation of the start up/kick off and also whether some team building was done. Finally, participants were asked whether they had noticed problems in the last project. They got a list of 14 items that are often referred to as a problem in distributed teams.
The third and last section focused on the project manager competences. Participants were asked to prioritize and rate the technical and behavioural competence according to importance. The participants were also asked to select from a list what they considered to be the main challenges of working in a virtual team.

Online survey

Many methods exist to implement online surveys. One is to use free services that are online. These services offer to set up surveys and host them. This way was taken. The chosen supplier was Free Online Survey (http://freeonlinesurveys.com). The reasons for the selection of this procedure include the following: simple interface, great variety of questions types, prevention on duplicate responses and export to Excel.

Pilot survey

A pilot survey was conducted before the main survey was sent out for feedback. Four individuals were asked, all of whom were known to be involved in virtual teams.
Only one of four did not know the concept of a virtual team or distributed work group despite have participated in such a group. To clarify this the following definition of virtual teams was placed in the header of the survey: *"A virtual* team (also known as a geographically dispersed team or GDT) is a group of individuals who work across time, space and organizational boundaries with links strengthened by webs of communication technology." Other issues that emerged in the pilot survey regarded the wording of the questions as some of them turned out to be too complicated. An attempt was therefore made to simplify the phrasing of the questions. And finally, in the third section, where the participants were asked to prioritize competence, the list turned out to be too long. It was therefore decided to change the questions format and ask participants to rate each item.

After obtaining permission from management a link to the online survey was sent by email to employees of GoPro who work in software development and in virtual teams.
The survey was sent to 38 employees. It was open for 3 days and 33 valid responses were received (86.6%).

3. Results

The main outcome from the survey is that a combination of soft and hard is needed to lead virtual teams in IT projects. Technical competence is not sufficient to be successful in this field. In most cases there was no significant correlation between two parameters; usually only a slight or no correlation. The exception was a correlation between a sense of isolation and the team never meeting face to face. Also a correlation was found between some competences and the role in teams.

3.1. Survey findings

Background information

Of 33 participants, 24 were male and 8 female. Educational level was high; 20 participants had a B.Sc. degree, 12 had a Master's degree, and only one had a Diploma qualification. The participants had great experience in working in multicultural projects with 87.9% having taken part in such projects and 53.5% having taken part seven times or more. Only 18.3% had taken part in multicultural projects three times or less. Most participants had no cross-cultural training, or 60.6%. There were only three nationalities: Danish, Icelandic and Bulgarian, but the locations were five, i.e. the UK, the US, Denmark, Bulgaria and Iceland.

Information on the projects

75% percent of the participants were regular team members in their project; the rest, or 25%, were project managers. The average team size was around 5 members, with the most common size being 4-6 individuals. 4,2% of the projects had 10 or more members. Average project time was 8.2 months but the most common time was 3-6 months. Most of the projects had 2 languages or 54.2% and no project had more than three languages. The average number of organizations involved was 1.8. In most of the projects, two organizations were involved or 45.8%. The average number of project locations was 2.5; most had two or three locations. On average, the largest time zone difference was 4.2 hours; most common were 3 hours differences or 50% of the instances.

Most of the teams had little direct communication, face to face, with 58% never meeting and 12.5% meeting once during a project's duration. Phone calls or Skype calls were often the main mode of communication or in 62.2% of the instances (see chart X). The frequency of team meeting was rather high: 75% had team meetings daily or every other day. 79,8% responded that no or too little team building had been done at start up in the last project that they participated in.

Problems that occurred in the projects

Chart 1 shows the main problems encountered in the project teams. Lack of clear objectives for the project and technical problems were the most common problems, but time difference, different public holidays, and recognizing the need for support was also reported. Very few encountered problems due to no commitment, cultural differences, lack of trust or lack of leadership. No one encountered problems due to religious views.

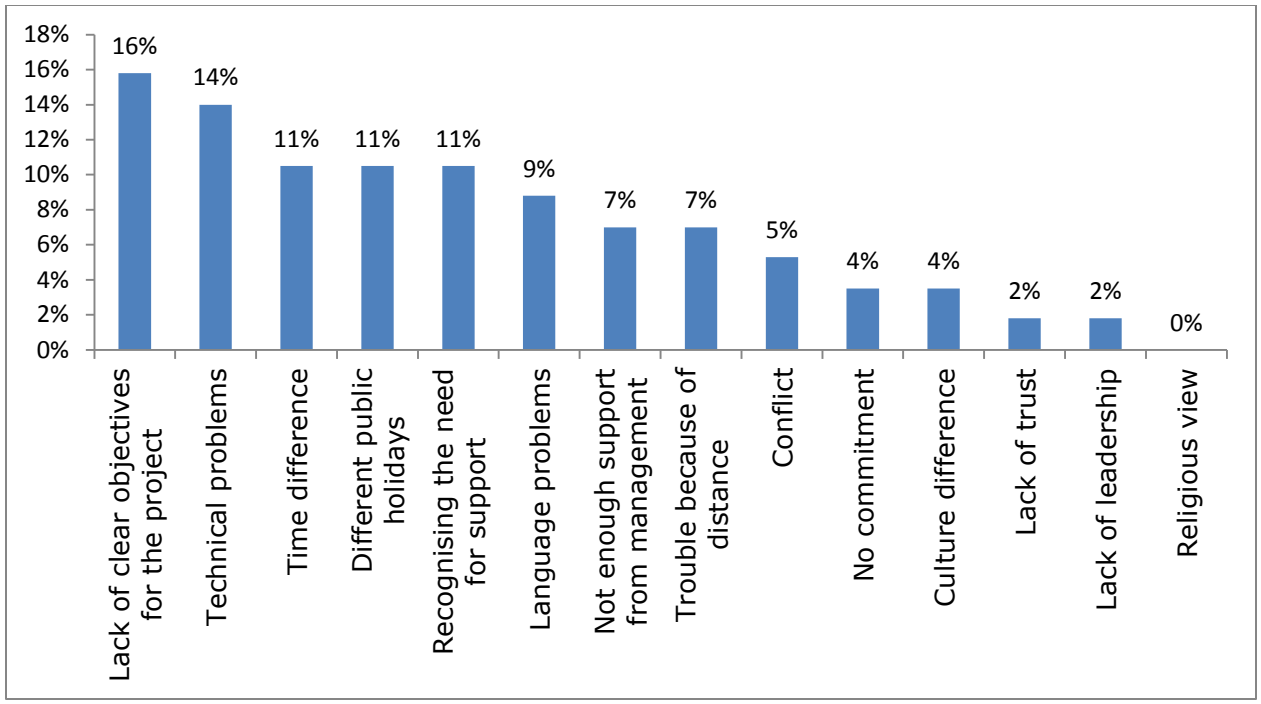

Chart 1 -Problems that occurred in the projects

Importance of competence needed in Project Management in IT

The elements that participant found challenging with working in virtual team are displayed in Chart 2.

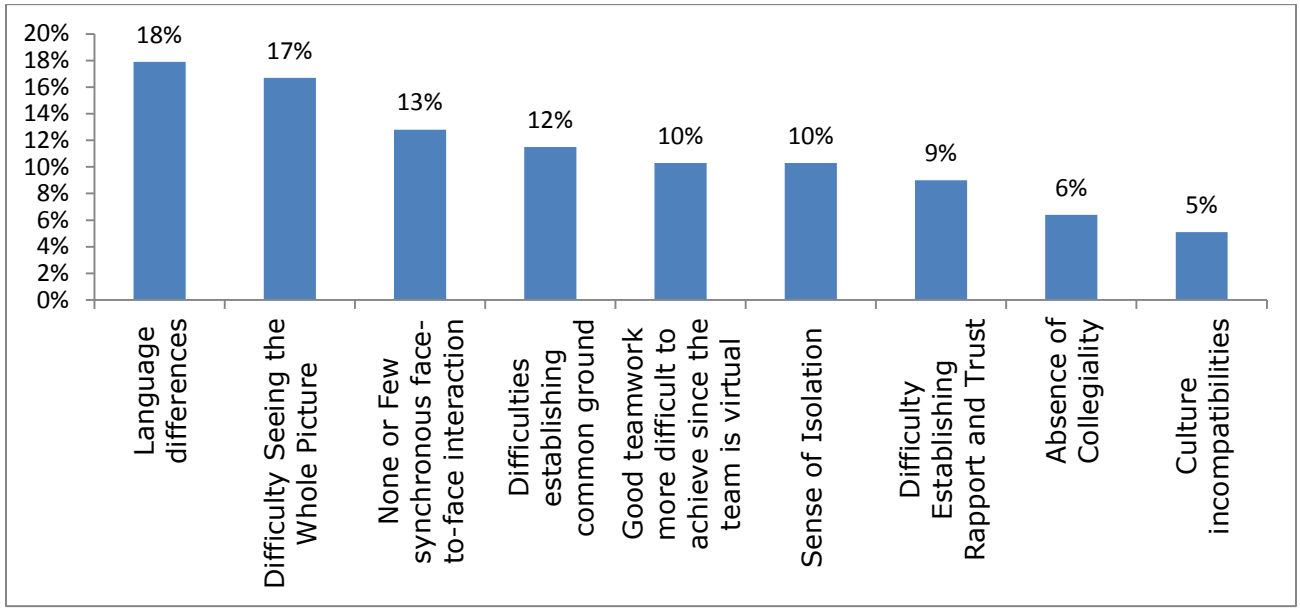

Chart 2 - Elements that participant found challenging

There was a significant correlation between those participants who reported a sense of isolation and the team never meeting face to face, or 62.5% of the participants.

The ranking of behavioural competence when the participants were asked to rate each separately is shown in Chart 3 below.

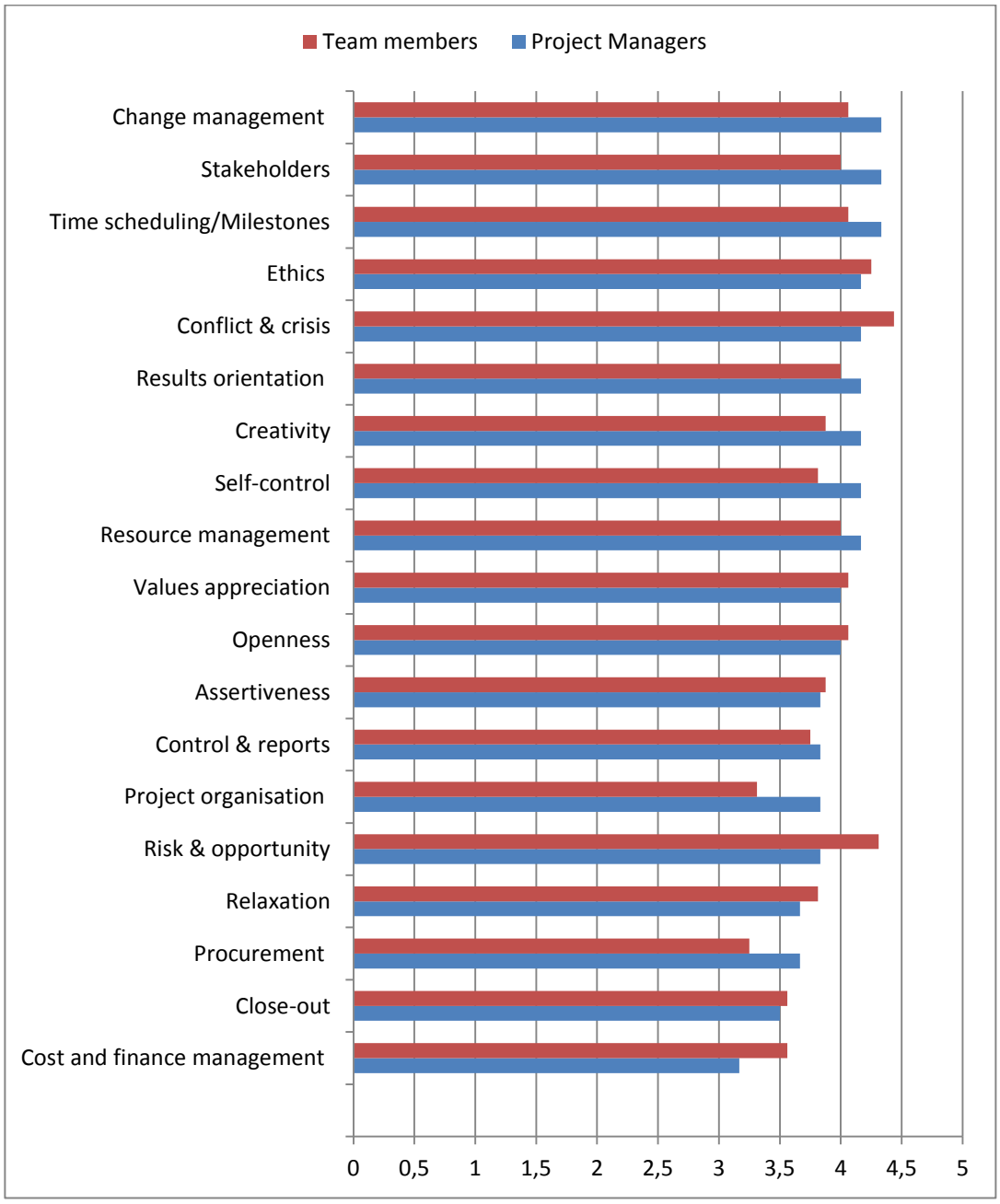

Chart 3 - Correlation between importance of behavioural competence and role in team

The rating of the technical competence, i.e. when participants were asked to rate each separately is shown in Chart 4.

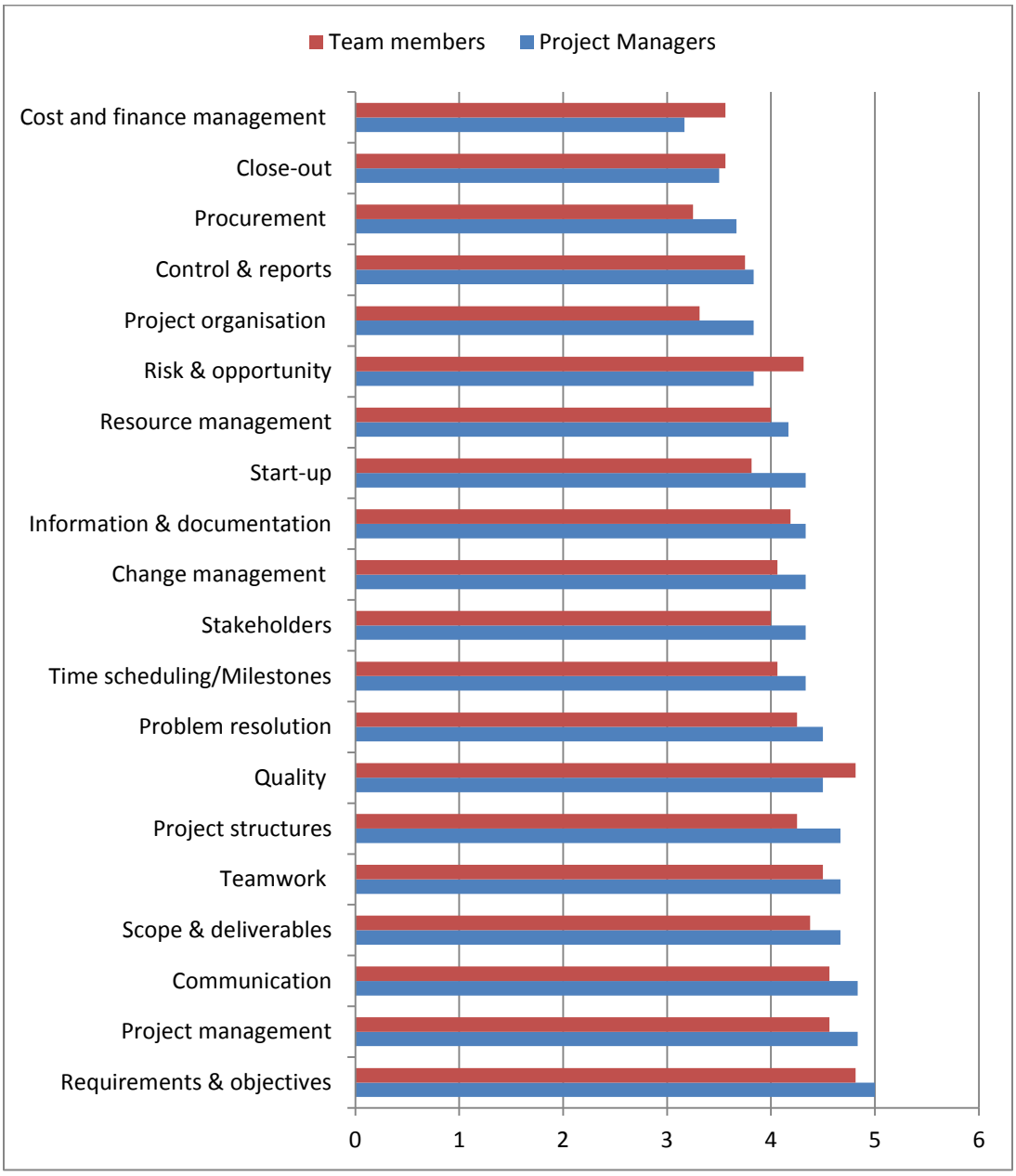

Chart 4 - Correlation between importance of technical competence and role in team

Below on Chart 5 the ten competences that scored highest in participant rating are listed. The Table 1 shows how these competences are categorised into technical and behavioural competences on the one hand, and hard and soft skills on the other hand.

Competences	Technical/ Behavioural	Hard/ Soft
Requirements & objectives	T	H
Reliability	B	S
Project management	T	S
Communication	T	S
Quality	T	H
Leadership	B	S
Teamwork	T	S
Scope & deliverables	T	H
Efficiency	B	S
Project structures	T	H

Table 1 - Showing categorisation on Technical/behavioural and soft/hard competences

Chart 5 -Rating of the top teen competences

The Chart 6 shows the result from the survey, division between technical and behavioural competences on the one hand, and hard and soft skills on the other hand shown in Chart 7 below.

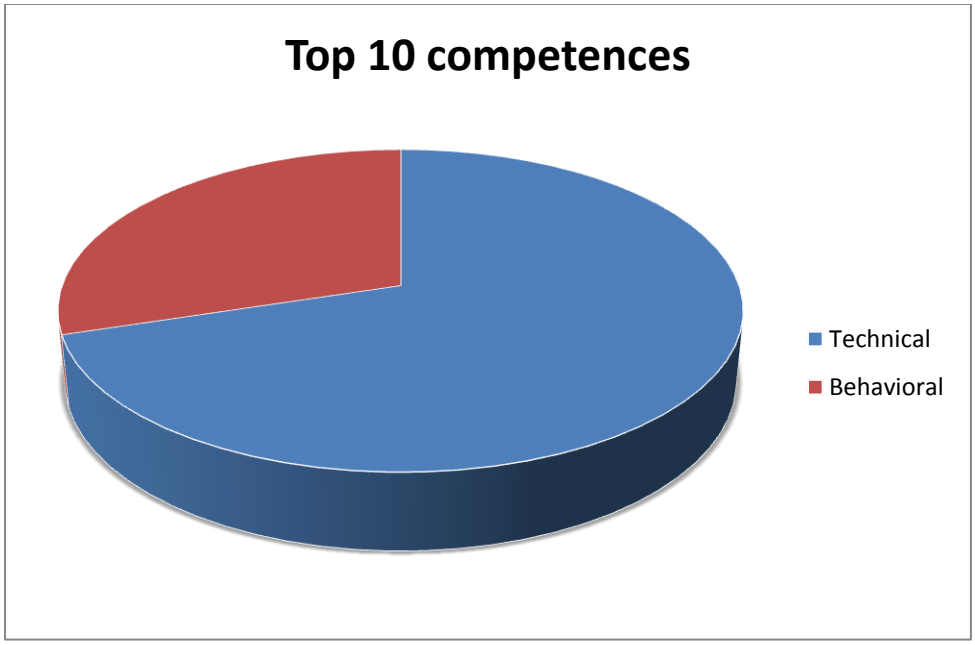

Chart 6 - Top 10 divided by Technical or Behavioural Competences

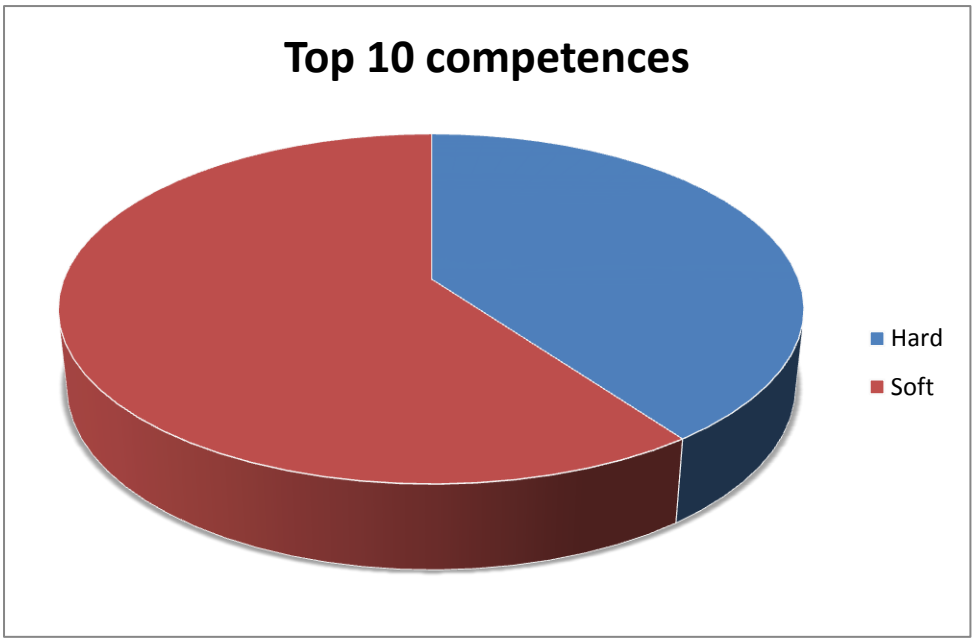

Chart 7 - Top 10 divided by Hard or Soft competences

4. Discussion

This paper has studied the project manager competences needed to lead an IT project in a distributed environment. It has looked at what combination of behavioural and technical competence might be needed. First, this topic was discussed from the perspective of existing literature, and then from the outcome of the survey that was conducted within a software company, which is a project driven company using virtual teams in its daily business.

The categorization of soft and hard skills does not reflect the technical and behavioural competences directly in the Eye of Competences. Among the ten competences that respondents of the survey ranked the highest, three are defined in the Eye as technical, but would fall under soft competences in the definition used in this paper, i.e. project management, communication and teamwork.

The decision to let participants rate the competence rather than prioritize them may have reduced the possibility of seeing marked differences between competences. A better method would have been to use the pilot survey to get top competences and let the participants in the main survey prioritize them.

Lack of trust scores lower than in most studies on virtual teams. One possible explanation is that the participants of this study all work in the same company, although in distributed teams. It's more common, at least in the software industry, to outsource to separate companies.

Technical problems scored rather high. Here the cause might lie in a misunderstanding as to what was meant with technical problems. When working on developing software a variety of technical problems can arise, more often directly connected to development, rather than deriving from working in a dispersed team.

The fact that competences such as requirements, objectives, scope and deliverables are scoring high is consistent with other studies, e.g. Smith and Sinclair (2003). They summarize it in the following words: "Virtualism requires a rather more robust and clear view of exactly what outcomes are required (there is less opportunity to share team perspectives.)" (Smith & Sinclair, 2003). The finding that virtual team members found time zone differences and language difference challenging is also consistent with other studies such as the study done by RW3 Culture Wizard in 2010 (The Challenges of Working in Virtual Teams -Virtual Teams Survey Report - 2010, 2010).

Perhaps a new competence needs to be added to the Eye of Competence, one that focuses on virtual work processes, since globalisation is spreading at a fast rate, and companies are increasingly using distributed teams as part of their daily business.

5. Conclusion

From both the survey's findings and the literature review it can be stated that both soft and hard skills are needed for the optimal IT project manager to lead a virtual team.To be successful in this area it is not sufficient to be outstanding in technical competences. Soft skills like communication, teamwork and leadership are just as important.

Even though the research was confined to only one software company it should have given some indication as to what is needed to manage an IT project using virtual teams. Future studies are needed that would reach across the IT industry where globally distributed teams would be further investigated as well as their leadership.

To summarize, the most important competence for leading successful a virtual IT team are;

- The team has to be able to see the whole picture / Clarity of objectives
- Leadership/Project management
- Communication
- Reliability/Efficiency
- Teamwork
- Quality Management

6. Acknowledgement

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Appendix A

Survey about working in Virtual teams

A virtual team (also known as a geographically dispersed team or GDT) is a group of individuals who work across time, space and organizational boundaries with links strengthened by webs of communication technology.

The first page of 3 is about background information

1) What is your gender?

2) What is your Nationality?

3) Have you received any cross- cultural or how to work in virtual team training(training in working with people from different cultures / working in distributed team)?

4) How many projects have you participated in where the project team was a virtual team/distributed team?

Last Project that you worked on in a virtual team

5) Which best describes your role in your last team?

6) How many members worked on your last team?

7) Did you know the team members that you worked with in your last virtual team?

8) What was the duration of your last project?

9) How many native languages where used by members of your last intercultural team

10) How many organizations or corporations participated in your last international team

11) How many different locations were worked on in your last intercultural team

12) What was the most time Difference between 2 locations

13) How was the Kick off of the project done?

14) Did the Project manager do some activity to get the team building (empowering)?

15) Did your team meet face to face?

16) What was the main communication type?

17) How frequently were team meetings?

18) In your last project did you notice trouble with (select as many as you like)
Not enough support from management
No commitment
Culture difference
Language problems
Time difference
Different public holidays
Trouble because of distance
Technical problems
Lack of trust
Lack of leadership
Conflict
Religious view
Recognizing the need for support
Lack of clear objectives for the project

General questions about Project management for leading a virtual team

19) In what phase of the project do you think in projects issues usually rises if there are any?
Start up phase
Execution phase
Closing /finishing phase
None

20) How important is this competence for a leader to have to manage a virtual team					
	Not important	Some important	Neutral	Important	Very important
Project requirements & objectives are clear					
Scope & deliverables are well defined					
Time scheduling/Milestones					
Analysis of stakeholders					
Project management					
Quality					
Risk & opportunity are well defined					
Project organization (organizational chart for the project)					
Teamwork					
How Problem resolution are handled					
Project structures (Break down into tasks, work packages and activities)					
Change management					
Control & reports					

Information & documentation					
Communication					
Resource management					
Cost and finance management					
Procurement					
Start-up					
Close-out					

21) How important is this competence for a leader to have to manage a virtual team					
	Not important	Some important	Neutral	Important	Very important
Leadership skills					
Engagement & motivation					
Self-control					
Assertiveness					
Relaxation					
Openness					
Creativity					
Results orientation					
Efficiency					
Consultation					
Negotiation					
The ability to handle Conflict & crisis					
Reliability					
Values appreciation					
Ethics					

22) Please prioritize this competence for the leader to lead a virtual team (1 highest and 4 the lowest)
Communication (the leader provides continuous feedback, engages in regular and prompt communication, and clarifies tasks)
Understanding (the leader is sensitive to schedules of members, appreciates their opinions and suggestions ,cares about members problems, gets to know them, and expresses a personal interest in them)
Role clarity (the leader clearly defines responsibilities of all members, exercises authority, and mentors virtual team members)
Leadership attitude (the leader is as confirm yet not too caring, relates to members at their own levels, and maintains a consistent attitude over the life of the project).

23) In a virtual team what of do you think is the main challenge? (select as many as you want)
Language differences
Culture incompatibilities
Difficulties establishing common ground
None or Few synchronous face-to-face interaction
Good teamwork more difficult to achieve since the team is virtual
Absence of Collegiality
Difficulty Establishing Rapport and Trust
Difficulty Seeing the Whole Picture
Sense of Isolation