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E-leadership for project managers:

virtual leadership and trust-building for perceived project success

Master Thesis within Business Administration

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Master's Thesis in Business Administration

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Abstract

Background Globalisation has brought substantial changes to the global economic landscape and has intensified organisational leadership complexity. Therefore, the rapid global expansion and the fast-moving technology have increased virtual collaborations and created opportunities for organisations worldwide. Thus, many organisational projects are characterized by a certain degree of virtuality which developed the need for alternative leadership in a virtual context, a phenomenon more relevant as businesses move toward more non-traditional work.

Purpose The purpose of this thesis is to explore the leadership of project managers in a virtual setting, focusing on the challenges to virtual leadership, on trust building, and task- and relationship-oriented leadership behaviour for perceived project success.

Method Semi-structured interviews were used to assess leaders' behaviour in virtual projects, how trust was achieved and how the challenges specific to the virtual context affected perceived project success. Questionnaires were used as part of the triangulation technique in order to add the perspective of team members and increase the validity of results. Therefore, a mixed-methods design was employed.

Findings The results of this study revealed that technology affects communication through low synchronicity and social presence; cultural differences affect how team members perceive project goal achievement, and task-related conflicts have a positive impact on effectiveness. Moreover, trust was initially achieved through creating a unifying purpose for the members, whereas along the development of a project, the influence project leaders had on trust was often limited to the temporary nature of projects. Also, task-related leadership behaviour increases in importance at the beginning and end of a project and the relationship behaviour more in the middle stages. Shared leadership was perceived as beneficial for coordination of tasks but it did not apply to decision-making.

Conclusion E-leadership encounters challenges that increase task-related leadership behaviours and render trust-building difficult to achieve. However, the virtual environment creates opportunities that project managers should seek to foster and reduce the constraints of these challenges.

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CHAPTER 1

Introduction

This chapter introduces the concept of virtual teams and leadership and initiates the discussion on challenges facing e-leaders.

The gaps are identified and the purpose presented, which focuses on exploring the leadership of project managers in a virtual working environment.

1.1 Background

Globalisation is a phenomenon that has brought substantial changes to the global economic landscape and has intensified organisational leadership complexity (Sheppard, Sarros & Santora, 2013). The technological innovations have led to the shaping of a whole revolution in organizations around the world, where human interactions are now mediated by information technology (Cascio & Shurygailo, 2003). It is especially imperative in the context of global projects and geographically dispersed project teams to focus on the integration of information technology (IT) tools and to manage cultural diversity in dealing with project risk and complexity to improve efficiency, effectiveness, and innovation (Anantatmula & Thomas, 2010). Virtual teams are not something proliferating in today´s business only; the popularity will continue to increase in the future as well (Lee, 2014).

According to Nauman, Mansur Khan and Ehsan (2010), project management represents a growing field of research, and many organizations have teams characterized by a certain degree of virtuality. In addition, the increasing degree of virtuality emphasizes the need to understand the effectiveness of project management and its subsequent success (Nauman et al., 2010).
Zigurs (2003, p.40) defines a virtual team as "a collection of individuals who are geographically and/or organizationally or otherwise dispersed and who collaborate via communication and information technologies in order to accomplish a specific goal". The traditional team and the virtual team have in common the fact that they share common work, a product or project goal; and what differentiates them is that virtual teams often do this without physical interaction (Lee, 2014).
Thus, the need for leadership in a virtual team environment has become increasingly relevant as businesses move toward more non-traditional work (Cascio & Shurygailo, 2003). The key difference of virtual leadership, or otherwise called, e-leadership, compared to traditional leadership, is that it takes place in a context mediated by information technology. "E-leadership refers to leadership of those projects with virtual teams or teams that are not collocated" (Lee, 2014, p.4). The virtual environment brings up new leadership challenges, especially concerning communication. If these challenges are managed incorrectly, it may slow down the primary leadership functions such as communicating, influencing, decision-making and managing (Lee, 2014). One of the key factors for a successful performed project is the leader's ability to manage interactions between people.
Collaborating across cultures, geographies, time-lines and functions with the help of different information technologies represents the major challenge for the global project leaders (Moran & Youngdahl, 2008).

1.2 Problem Statement

Leading in the virtual environment poses challenges to traditional work groups in functional organizations and demands an alternative approach that requires the evaluation of the leadership competencies to manage at a virtual level (Lee, 2014). The question of 'How can I manage them if I can't see them?' (Cascio, 2000, p.81) is on-going and it reveals a set of barriers for the virtual team that affect communication and team relations such as unclear roles and responsibilities,

management agenda and leadership style, expectations creep and unevenness in processes (Lee-Kelley & Sankey, 2008). In addition, Avolio, Kahai and Dodge, (2000) argue that e-leadership will transform the models of leadership, and the way it is measured and developed in organizations, even though many aspects of leadership will also remain the same. However, Bell and Kozlowski (2002), cited in Nauman et al., (2010, p.639) claimed in their theoretical review of virtual teams that "there is little current theory to guide researchers on the leadership and management of virtual teams".

Given the challenges of a virtual setting, how should leaders ensure the success of their projects? Should they control processes or people? What skills, knowledge and attitude do they need in order to create an environment that fosters motivation, trust and enhances organisational effectiveness? How should leaders build relationships and social bonds within the team, given the temporary character of the projects and the use of technology? Also, one of Lee's questions (2014, p.15) remains unanswered: "How can the virtual project manager lead using management by walking around (MBWA) in a modern organization?" To current date and to our knowledge, there is limited research on leadership behaviour for virtual projects and these questions have not been adequately approached.

According to Goodbody (2005), less than 30% of virtual IT projects have been completed successfully. A successful project is defined by Kendrick (2012, p.117) as a "project that is implemented on time, within budget, and with the expected quality level defined by the customer(s)". However, besides the 'iron triangle' of time, budget and quality performance, qualitative variables (the project 'intangibles'- leader's behaviour, vision, values, trust, quality of relationships) are also critical for success (Lee-Kelley & Sankey, 2008, p. 51). Therefore, what skills and techniques should leaders develop to ensure that the projects are delivered on time, within budget and with the required quality to satisfy stakeholders?

The above definition of success encompasses objective measures of project success that are dependent on a set of external factors and might not represent the actual success perceived by project managers. Even if most definitions of project success include the triple criteria of time, budget and quality, according to Agarwal and Rathod (2006), a project is not fully successful or failure if seen from the eyes of the stakeholders involved in it. Moreover, the same outcome can mean different things to different people involved within the project. Therefore *perceived* success and *perceived* effectiveness of projects and leadership would be the wisest choice to a "more satisfying and correct picture of project performance" (Agarwal & Rathod, 2006, p. 369).

Hence, for this particular study, we will rely on project managers' perceived definition of project success, since assessing it based on the variables of time, budget and quality as well as on financial measures would be difficult to estimate and would leave out factors that could be essential for the purpose of this study.

In his study, Kostner (1996), cited in Lee-Kelley and Sankey (2008) claimed that a virtual leader has 'little or no power or control' over his team and that control is freely imposed by the members themselves. Nevertheless, Kayworth and Leidner (2001) observed in their study a dichotomy between team members wanting and expecting direction, guidance and motivation and team leaders who, faced with the constraints of distance, would prefer members to be more independent and self-managing.

Trust is important for all teams but especially for the teams that are acting virtually. Being highly connected with the cooperative behaviour in the team, trust is critical in order to be successful. The diverse locations and the technology-based communication are factors that make trust more difficult to build (Greenberg, Greenberg & Antonucci, 2007). Therefore, given the distorted social context in which virtual teams operate, it is the leader's responsibility to build and maintain a social climate for the team unity and cohesiveness (Kayworth & Leidner, 2001).

As described above, there are ambiguous and sometimes opposite results concerning leadership in virtual teams. In order to support the growing body of research on virtual leadership, to further the current knowledge about the skills needed for achieving perceived effectiveness for virtual project success and create understanding of trust-building deemed as critical for team collaboration, we intend to carry out a mixed methods study to identify issues and offer suggestions which might be helpful to managers and academics.

1.3 Purpose

The purpose of this thesis is to explore the leadership of project managers in a virtual working environment.

The main research questions that will drive the study are:

RQ1: How do the challenges specific to a virtual working setting affect virtual leadership perceived effectiveness and perceived project success?

RQ2: How is trust accomplished in a virtual setting, given the temporary aspect of projects?

RQ3: How is leadership behaviour different in virtual projects compared to face-to-face projects?

1.4 Disposition

Chapter 2 Presents the selected pre-knowledge in the areas that are related to the purpose of this study. It focuses on virtuality in project management, challenges related to the virtual character of projects, trust-building, leadership behaviour and shared leadership.

Chapter 3 Describes the research methodology employed by explaining the choices concerning the concurrent mixed-methods research, the abductive approach, the case study strategy, the qualitative and quantitative data collection techniques and the data analysis methods.

Chapter 4 Presents the main findings and analysis in relation to the theoretical body of knowledge on e-leadership for project success. The results were obtained from interviews with seven project managers and a survey with 32 respondents.

Chapter 5 Presents the research conclusions, theoretical contributions, practical implications and suggestions for future research.

CHAPTER 2

Frame of Reference

In this chapter we discuss the concept of E-Leadership, project success and trust-building within virtual teams.

First, we set the foundation of virtual leadership by exploring the transition from traditional projects to virtual projects and also we describe the distinctive challenges of working with virtual teams.

Second, we analyze trust-building by presenting Greenberg et al.'s (2007) model of *Type of trust required in team stages*, as critical for virtual teams and project success.

Next, we focus on virtual leadership by emphasizing the characteristics of the relationship and task-oriented leadership behaviours and their importance to leading virtual teams.

We end up this chapter by introducing shared leadership as a distinctive leadership style for virtual working environments.

2.1 Project management and virtual teams

In today's global environment of intense competition, organizations place an important role on how they practice project management (PM) in order to achieve a sustainable competitive advantage (Anantatmula & Thomas, 2010). The increasing complexity of software-intensive systems that has occurred over the last 20 years, the customer's desire to place more risk with the developer and the companies' need to stay ahead of competitors represent the driving forces that brought new challenges to managing projects within organisations (Nidiffer & Dolan, 2005). Historically, project management is a discipline that existed from the beginning of our civilization, finding its roots in the aerospace and construction industries (Nidiffer & Dolan, 2005; Yasin, Martin, & Czuchry, 2000). However, within the last century a huge body of management knowledge has arisen in order to support the increased decision velocity and cohesiveness in today's distributed world.

How is a project defined? *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* (Project Management Institute, 2008, p.5) gives a consensus definition of a project as "a temporary endeavour undertaken to create a unique product, service, or result, [...] with a definite beginning and end". In addition, Yasin, Martin and Czuchry (2000, p.20) mention that in practice, "most projects depend on finite or limited resources by which objectives are to be accomplished".
Also, the Project Management Institute (PMI) (2008, p.6) identifies the following stages of managing a project:

- Identifying requirements,
- Addressing the various needs, concerns, and expectations of the stakeholders as the project is planned and carried out,
- Balancing the competing project constraints including, but not limited to:
  - Scope,
  - Quality,
  - Schedule,
  - Budget,
  - Resources, and
  - Risk.

According to PMI, if any one factor changes, at least one other factor is likely to be affected.

Concerning project success and project management effectiveness, research has identified the following related categories: (1) organizational structures, (2) project management tools and methods, (3) leadership competence, (4) critical success and failure factors and (5) the characteristics of an effective project manager (Nauman et al., 2010).
According to Lee (2014), it is the project manager's responsibility to use the skills, tools and techniques to complete the projects on time, within budget and to the satisfaction of the key stakeholders and sponsors.

The project management discipline is better off today than 20 years ago. Before, companies were just focusing on internal results, customer requirements and industry structure, failing to adapt to the fast-changing competitive environment (Nidiffer & Dolan, 2005). Nowadays, however, in order to rapidly respond to the globalization challenges, many organisations switched from traditional collocated project teams to teams characterized by a certain degree of virtuality (Nauman et al., 2010). Additionally, organisations must keep up with communication and technological innovations and build strategies to optimize the skills and knowledge that exist within each organisation (Oguntebi, 2009).

2.1.1 From traditional projects to virtual projects

The virtual team emerged as a new form of structure able to meet the challenges of a new context described by a growing popularity of interorganisational alliances, a tendency to flatter organizational structures and globalization and as a result of the shift from production to service-related businesses (Kayworth & Leidner, 2001). According to Lee (2014), virtual organizations represent a reflection of the ever-evolving non-traditional work environment of the 21st century. Global virtual teams and global projects are inevitably linked to each other; a global project being defined as "a temporary endeavour with a project team made up of individuals from different countries; working in different cultures, business units, and functions; and possessing specialized knowledge for solving a common strategic task" (Anantatmula & Thomas, 2010, p. 60). Correspondingly, a global virtual team is defined by three dimensions: (1) members physically located in different countries, (2) interaction through the use of computer-mediated communication technologies (electronic mail, chat rooms, etc.), and (3) members may not have common past or future of working together (Jarvenpaa & Leidner, 1998).

Contrary to thinking of a team as virtual or not, researchers have now viewed virtuality as a continuum, claiming that many teams in organizations today differ in the amount of virtualness and are characterized by dimensions of virtuality (Griffith, Sawyer & Neale, 2003). Figure 2.1 depicts the different dimensions of virtuality as a circle, the circle showing that there is no implication of a rank order and the more virtual a team becomes, the more complex are the issues it must address to ensure effective functionality (Zigurs, 2003, p.340).

Related to Figure 2.1, Nauman et al., (2010) define less virtual projects as the projects where team members are located within the same borders, but rely on technology in order to communicate. This can be the case of a team collaborating with outside contractors from a different organization. Hence, this marks the beginning of virtuality, the virtual team being characterized by geographic and organizational dispersion. If one broadens the group of contractors with overseas contractors, the virtuality increases with temporal and cultural dispersion. These are described by Nauman et al., (2010) as more virtual projects.

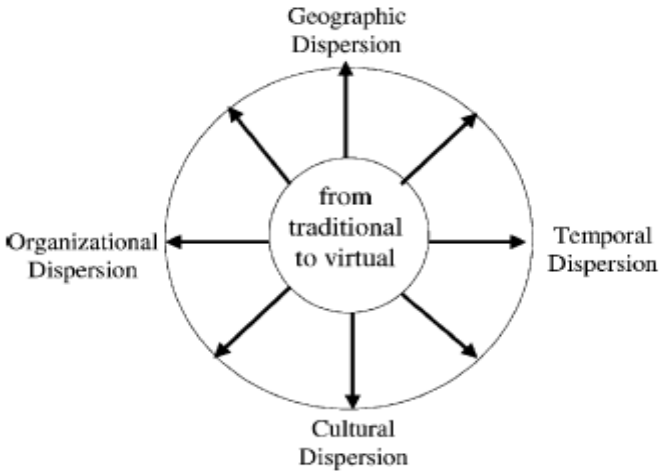


Figure 2.1: Dimensions of Virtual Teams (Zigurs, 2003, p.340).

According to Griffith et al., (2003) teams fall in three distinct categories: traditional (teams that do all their work face-to-face), hybrid (teams that interact both face-to-face and virtually, according to the needs of the moment) and pure virtual (teams that have never met face-to-face and communicate through communication media). Lee (2014) asserts that the most prevalent type of virtual team in organizations is the hybrid team. The challenge for the leaders of hybrid teams is that they have to be competent at managing both traditional collocated teams and virtual global teams.

What do we know so far about what is important for virtual teams? Dubé and Paré (2001) identified people and technology as key elements for global virtual teams. Strong communication and cooperation represent an essential component of project success in virtual teams (Jarvenpaa & Leidner, 1998; Lee-Kelley & Sankey, 2008; Anantatmula & Thomas, 2010). Trust has also received considerable attention from researchers as it is so fragile and difficult to obtain and maintain (Zigurs, 2003). The cultural aspect is emphasized by Anantatmula and Thomas (2010) as a barrier encountered by the global project team as well as the project team and its external stakeholders.

Likewise, being characterized by overreliance on a technology infrastructure, problems take longer to be detected and resolved in virtual teams since distance amplifies dysfunction, diffuses leadership and weakens human relationships (Davis, 2004). In addition, challenges stem from the complexity of types of virtual teams, their tasks and the context in which they operate, which "makes it difficult to develop simple checklists that apply across the board" (Zigurs, 2003, p.341).

2.1.2 The challenges of working with virtual teams

Distinguishing between the challenges of virtual teams and those of co-located teams is essential for a better understanding of what knowledge, skills and aptitudes are required to be an effective leader (Johnson, 2010).

According to Zofi (2011), there are a couple of challenges that are important to consider before working with virtual teams. These are: How to build relationships within the team? How to assess

the members' performance? How to communicate? How to know what the members are capable of in order to delegate? How to perform team building without the members having previously met in person? How to know of the existence of a conflict since the team is so dispersed? How to deal with promotion in the team?

In addition to these challenges, there are three variables significantly important that may be seen as key variables affecting virtual teams. These three variables are time, space and culture. Team members who are located together (shared space), who work according to the same schedule (shared time), and know how to work together (shared culture) have an advantage over the virtual teams concerning formal and informal communication for collaboration (Fisher & Fisher, 2011).
A key driver for virtual teams in order to communicate across time and distance is the technology. Other truly important components are the skills in communication and teamwork (Windsor, 2001). For global teams, it is much more challenging to build chemistry and create bonds between members because of different time zones and cultural diversity. Also, teams that are dispersed have a harder time to create relationships and get to know each other because of the limited face-to-face meetings (Martinelli, Rashulte & Waddell, 2010). Furthermore, besides nationality differences, there are differences in education and personal life experiences that might lead to cultural misunderstandings and undermine effective work (Fisher & Fisher, 2011).

Virtual teams are more likely to be chosen for a limited time period and for a specific mission, and when this is completed, often the team is disbanded. The problem identified here is that the dynamics of an effective virtual team takes time to develop. Teams that are effective go through stages of forming, storming, norming, performing and adjourning, in order to build up high levels of trust and cohesion within the team (Zaccaro & Bader, 2003). Therefore, the members in the virtual and traditional teams learn how to interact with other members in an effective way and also to agree upon standard operating procedures which facilitate trust building between the members (Zaccaro & Bader, 2003). Since global teams usually do not have any social bonds or other foundation of trust that traditional teams do, the global dispersed teams might be collaborating in an environment where trust is lacking (Martinelli et al., 2010). Moreover, since the period of time is short because of the temporary character of virtual projects, the members may miss the necessary motivation to go through the before mentioned stages of forming, storming, norming, performing and adjourning in order to build high levels of trust and unity. If the team does not go through all these stages, it might end up as a dysfunctional group (Zaccaro & Bader, 2003).
Another challenge is to create a common purpose for the virtual team. This would represent a way for the team leader to get the members to think about the goals of the team instead of their personal ones (Martinelli et al., 2010).

- ***Technology and Communication***

Virtual teams depend heavily on technology in order to communicate. The hindrances for attaining successful communication consist in both the technology not always working and the need for the team members to learn and get used to different communication technologies

(Jansson, 2005). Kayworth and Ledner (2001, p.10) mention concerning the latter aspect that since individuals have different predispositions to learn new technologies, "membership on virtual teams may be highly biased toward those individuals skilled at learning new technologies against those who experience technophobia." Concurrently, quite often, individuals focus on technologies that they know well, not particularly because it is the best way for a certain situation, but because it is convenient and does not require much initial effort in utilizing it (Jansson, 2005).

Also, since virtual teams rarely meet face-to-face, a lot of information that one would usually obtain from face-to-face interactions and from which one can derive meaning and value, might be missing in virtual communication (Rothbard & Pottruck, 2013). This information refers to the tone of voice, facial expressions and body language. Technology either creates disparities between words and body language, or some of the technologies such as phone calls and online exchanges cannot even convey facial expressions, which might lead to false interpretations or misunderstandings (Rothbard & Pottruck, 2013).

Figl and Saunders (2011) state that media choices within virtual teams are characterized by three essential aspects: social presence, media richness and media synchronicity. Social presence gives participants the feeling that others are involved in the communication process, being high for face-to-face interactions and very low for textual media (e.g. emails). Moreover, high media richness is critical for ambiguous tasks that require a lot of information to reduce insecurity. Also, media synchronicity allows members to work together on the same activity, at the same time.

Furthermore, Armstrong and Cole (1995) mention that a shared agreement between dispersed team members concerning how to use the technology, like clear group norms, is as important as the technology itself.

Solutions to facilitate communication through information technologies are also proposed by Rothbard and Pottruck (2013) and include summarizing the key points of what has been said during a virtual meeting, creating space for others to speak and contribute in order to boost creativity, noticing the tone, emotions as well as the words of the speaker [...]. Also, Mortensen and O'Leary (2012) encourage managers to focus on the factors that shape their daily behaviour when choosing the right technology and rely on simplicity, reliability and accessibility.

- ***Cultural differences***

Culture in virtual teams is of major importance and should not be understated. According to Kerzner (2009), culture can be divided into 4 categories: functional, team culture, national and organizational. These cultures may act as sources of competitive advantage for the virtual teams that know how to make use of cultural differences to create synergy. Cultural differences can create more robust outcomes and distinctive advantages for those team leaders and team members who understand and are sensitive to the differences and also use it in a positive way (Kerzner, 2009).
Of great relevance and importance when assessing differences in national cultures are Hafstede's five cultural dimensions: power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, long-term orientation (Browaeys & Price, 2011). For virtual teams, cultural differences might have a great impact on the adoption and use of internet, the way

members build trust, the disposition to accept uncertainty, the motivation and satisfaction to work in a virtual environment, the way team members communicate (Mihhailova & Piiriste, 2005). Also, Mihhailova and Piiriste (2005) mention in their study that in the future, the national culture will probably have less impact on virtual work than occupational or organizational culture. Except from national culture, cultural differences in organization affiliation, personal life experience, or education could be a cause to cultural misunderstandings and also weaken effective teamwork (Fisher & Fisher, 2011).
One of the important aspects of understanding and working with cultural differences is to create a team culture in which differences can be discussed in a respectful and productive manner and in which problems can be surfaced easily. It is vital to differentiate between problems that are rooted in cultural differences and those that are performance based. In a virtual team, there is a variation of different business practices and business ethics. Hence, it is important to clearly articulate personal approaches within the virtual team that all members understand and stand for (Kerzner, 2009).

- ***Conflicts***

Inherently, when people work together in teams, the emergence of conflicts is inevitable. Even if conflicts refer to antagonistic interactions between members, effective conflict management has a positive influence on team's unity and performance (Daft, 2014).
According to Ferrazzi (2012), there are two types of conflicts: task related and relationship related conflicts. Usually, relationship related conflicts are the most difficult to solve since they can lead to avoidance instead of a straightforward resolution. Task-related conflicts on the other hand, can lead to more effective ways of doing things. Also, Daft (2014) claims that teams which are characterized by a set of healthy conflicts, have high levels of trust and mutual respect.
However, the virtual environment represents a double-edge sword. Relationship- related conflicts do not occur too often because of less interpersonal communication and exchange of information. But, because of lack of face-to-face communication, task-related conflicts can quickly escalate into relationship disputes (Ferrazzi, 2012).
Hence, project management best practices advise the use of a team charter, with guidelines of how the team will resolve conflicts, so that conflict resolution within the virtual setting can be accomplished rapidly and efficiently (Lee, 2014).

Conclusively, many of today´s project teams have experienced a transition from traditional to a virtual working setting being an ever-growing element of global businesses. This has in turn created new challenges for project managers in terms of communication through computer-mediated technology, dealing with cultural differences, coordination of tasks, conflicts among others. Previous studies have pointed out to the unique challenges confronting virtual leaders and teams in their daily work. However, RQ1 addresses *how* the challenges specific to a virtual working setting affect virtual leadership perceived effectiveness and perceived project success.

2.1.3 Trust-building in virtual teams

According to Oxford dictionary, trust is "a firm belief in the reliability, truth, or ability of someone or something". Trust has also been defined by Mayer, Davis, and Schoorman (1995,

p.712) as "a willingness on the part of organizational members to allow themselves to be vulnerable and undertake actions based on the belief that other parties will perform their parts effectively without supervision or control". Trust is considered to be the foundation for effective teamwork and cooperative relationships (Thomas & Bostrom, 2010). In order to exist, trust requires time and interpersonal contact, fact suggesting that face-to-face interaction is often essential for trust building (Bradley & Vozikis, 2004).
As mentioned above, trust is a critical factor in all teams to be able to succeed, but it is particularly important in virtual teams since it is much harder to develop trust when team members are geographically dispersed and communicate through technology (Greenberg et al., 2007). However, Bradley and Vozikis (2004) mention that even if face-to-face meetings are difficult to arrange, there should be a greater emphasis on a richer communication media and high reliability of team members on trust expectations based on past experiences.
The initial trust between members in a virtual team is critical. The problematic part in trust building is that the members generally have no common past and no future to reference to as the backbone of trust (Lin, Standing & Liu, 2008). According to Jarvenpaa and Shaw (1998), cited in Bradley and Vozikis (2004, p. 111), "only trust can prevent geographical and organizational distances of team members from turning into unmanageable psychological distances".

Furthermore, Jang (2013) claims in his study of trust in virtual teams that trust is developed through frequent social interactions which allow people to get their information updated about other people's trustworthiness. The decision to trust others is according to Lewis and Wiegert (1985, p.970) based on "what we take to be 'good reasons,' that constitutes evidence of trustworthiness". According to Sarker, Valecich, and Sarker (2003, p.38):

> "Trust develops because team members are able to gain knowledge about the other collaborators through increased familiarity, and thus, able to confidently predict their behaviours. This prediction of behaviours is possible primarily through the exchange of task-related information in a consistent and reliable manner".

Teams go through different stages during their lifetime. The different types of trust required in the virtual team stages are illustrated in Figure 2.2 (Greenberg et al., 2007, p. 328). It is essential that the team leader and the manager encourage trust development at the beginning of the team formation and then foster trust all through the team´s life, during all stages. What makes this challenge even trickier is that during the different stages of life, trust seems to be based on a different assessment (Greenberg et al., 2007).

Figure 2.2: Type of Trust Required in Team Stages (Greenberg, Greenberg & Antonucci, 2007, p. 328).

The first step in the model above represents the establishment of the team, when team members have a tendency to dispositional trust. This type of trust means that members have the natural tendency to be more trusting based on the functional role of the other team members. Greenberg et al., (2007) call this type of trust otherwise, cognitive trust since it sets as a result of the members' performance reliability and competence. Also, this stage refers to actions that project managers could take before the first interaction of team members in order to create the foundation for trust building. Therefore, the key elements for the development of trust is to choose the right members, offer training and create a motivating reward structure (Greenberg et al., 2007).

The second stage is characterized by the development of swift trust. Since it is not always possible for a virtual team to meet face-to-face and have the socialization process, the members have to build trust by relying on earlier expectations and experience which is called *swift trust* (Bradley & Vozikis, 2004). Also, according to the same authors, if a team member previously worked in a team setting (not necessarily virtual) characterized by high trust, then the member assumes that a high level of trust exists in the new virtual team context as well, from the beginning. Initial trust can be very fragile (Jang, 2013). If the members' expectations are not met, the team might soon deteriorate (Bradley & Vozikis, 2004, p. 102). Moreover, it is the leaders' responsibility to individually endorse and to introduce previous achievements of team members, to initiate team building activities and create rules concerning communication in order to enhance swift trust.

Step three is the organizing stage. At this stage there is still a feeling of uncertainty and ambiguity within the team. Trust is based on cognitive assessment. It forms as a result of the assessment of other's competence to fulfil the project's goals and the perception of their integrity in interacting with the other members (Greenberg et al., 2007). Establishing social bonds are essential for successfully moving to the next stage. Frequent communication, non-task related communication, monitoring of communication patterns, and encouraging participation are important during the team period and can be reinforced through standardized routines of how and when to take contact and it should also include etiquette rules for the team members (Bradley & Vozikis, 2004).

The fourth stage, transition, is when the team transits from organizing activities to accomplishing the task. At this stage, the members should have developed working relationships, established roles and responsibilities, and also exchanged information. Trust is changing at this stage, the

cognitive trust is diminishing and the affective or benevolence trust is increasing, since members are shaping relationships. The leader of the team needs to acknowledge the team's performance and to provide guidance to complete the task (Greenberg et al., 2007).

The last stage is accomplishing the task, where the affective or benevolence trust is the one in focus. At this stage, the outcome based on group performance is important. Therefore, social bonds, benevolence and the integrity of individual members remain the main determinants of trust (Greenberg et al., 2007). Also, being in time with deadlines, and celebrating interim deadlines represent important aspects to be included in the assessment of trust at this stage. The positive assessment of member's benevolence which is central at this time can be achieved through creating strong social bonds (Greenberg et al., 2007).

Greenberg et al.'s (2007) model of developing trust among members of virtual teams creates a good understanding of the trust components at different stages of the team's life. Even though the authors propose some action steps for managers aimed at influencing each type of trust, the model has not been tested empirically.

According to the study by Jarvenpaa and Leider (1998), if there is a high level of trust in the team's early life, the members will solve problems and conflicts effectively and have positive communication in times of technical challenges or task uncertainty. In addition, the authors mention several challenges to trust, related to communication and frequency of interaction (e.g. computer-mediated communication technologies may hamper trust building) and principles of work habits.

- ***Face- to-face meetings***

Despite the claim of completely virtual teams, most team leaders try to gather their team members for face to face meetings at some point (Mortensen & O'Leary, 2012). A lack of face-to-face interaction within a project might create big challenges both to the team members and the managers of the project. The challenges that might occur are not only that the team needs to find other ways to facilitate communication, but it should also develop the ability to build trust and relationships within the team in order to shorten the psychological and geographical distance (Germain, 2011). Trust in virtual teams has been recognized to be more critical when face-to-face meetings are less common (Piccoli & Ives, 2003). Having face-to-face meetings in the beginning of the virtual team's life cycle is one way for virtual teams to achieve high levels of trust. Also having frequent face-to-face meetings during the virtual project represents an essential factor for trust-building (Brahm & Kunze, 2012). Moreover, Mortensen & O'Leary (2012) claim that repeated face-to-face meetings are best when occurring at predictable times and intervals.

Besides, organizing face-to-face meetings provides the virtual members with the chance to see the body languages and facial expressions of their teammates or leader. Notably, senses such as sight, touch, smell, and sound might play a robust and critical role in business communication (Winger, 2005).

Certainly, achieving trust in virtual teams is truly vital and critical for project success and effectiveness. Therefore, we see the use of Greenberg et al.'s (2007) model of "*Type of Trust Required in Team Stage"* as an effective tool to be further tested empirically in this research study, with the aim of covering the gap of lack of exploratory studies on trust-building based on different assessments of trust during a virtual team's life stages. Hence, RQ2 addresses how trust is accomplished in a virtual setting, given the temporary aspect of projects.

2.2 Virtual leadership

2.2.1 Defining E-Leadership

Today´s leaders need to have the knowledge and the understanding to lead in a multilingual and multicultural world as a result of organisations' struggles to operate globally. Therefore, organisations nowadays often have teams with members that are geographically dispersed in the world which makes the ability to use information technology even more important in order to keep in touch and cooperate (Zaccaro & Bader, 2003). This couples well with the definition of a virtual team which is "a collection of individuals who are geographically and/or organizationally or otherwise dispersed and who collaborate via communication and information technologies in order to accomplish a specific goal" (Zigurs, 2003, p.40). According to Zofi (2011), the leader of a virtual team also needs to be flexible in order to adapt to the global and diverse workforce. The leaders need to be aware and knowledgeable about differences in communication styles, worldviews, and ethics of the individuals they deal with, as well as they need to understand the political, historical and economic references of the different people.

The traditional organizational definition of leadership is "the ability to influence a group toward the achievement of goals" (Lee, 2014, p.17). The e-leadership has the same purpose as ordinary organizational leadership, to enhance the relationship between the organizational members spread out in the organization´s structure. The difference between the two types of leadership is that e-leadership takes place in a situation where the leadership is performed through different information technologies (Avolio & Kahai, 2003). The e-leadership relates more to the leadership of today´s constantly changing and non-traditional virtual business environment (Lee, 2014).
To define e-leadership in a different way, it has been referred to as a social influence process performed through information technology in order to produce a change in thinking, behaviour, attitudes and/or performance between different parts of the organization (Avolio et al., 2000). The e-leadership is not related to any specific hierarchical level and may be at any level in an organization. It may occur both between one-to-one and one-to-many interactions across and within large organizations and units, as well as at different levels (Avolio et al., 2000).

2.2.2 Leadership behaviour in virtual teams

Leadership behavioural theories concentrate on a leader´s style of action, normally categorized with view to task-orientation or people-orientation (Glynn & DeJordy, 2010). Task-oriented leadership behaviour is primarily concerned with reaching goals. Leaders with a task-oriented

behaviour help their employees complete their goals by defining objectives, giving directions, setting timelines, showing *how* to achieve the goals. It is also common that the leaders use a one-way communication method in order to clarify what needs to be accomplished, who will be responsible for what and through which approach the work should be done (Holloway, 2012). Task-oriented leadership (or initiating structure) states the quantity to which the leader identifies work roles. The leader sets up clear patterns of communication (Tabernero, Cambel, Curral & Arana, 2009), of organization and also develops methods for the team leaders to achieve project success (Kent, Crotts & Azziz, 2001). In addition, leaders with a task-oriented behaviour are concerned with production, feel the need of achievement, are work facilitators and goal emphasizing and are likely to be psychologically distant from their followers (Bass, 1990).

Relationship (people)-oriented leadership behaviour is more concerned with the development of close and interpersonal relationships than with the goals as such. The relationship-oriented leader is anxious to use a two-way communication method in order to show emotional and social support in his/her work task, shows concern, appreciation, acceptance, and respects feelings and needs of others (Holloway, 2012). Consideration behaviour leadership is related to the development of warm work relationships and development of respect and trust among co-workers (Kent et al., 2001). In Bass's view (1990), relation-oriented leaders have a stronger sense of trust in their team members, less felt need to control them and opt for more general supervision rather than a very close one.

In order to get a better understanding of the two types of leadership behaviour, Table 2.1 includes additional explanation (Holloway, 2012, p. 12).

Table 2.1 The Leadership Dimensions according to Stogdill (Holloway, 2012, p. 12)

Task-oriented behaviours	Relations-oriented behaviours
Production emphasis – applies pressure for productive results.	*Tolerance of freedom* – allows team members room for initiative, decision, and action.
Initiation of structure – clearly defines own role and lets followers know what is expected.	*Tolerance of uncertainty* – is able to tolerate uncertainty and postponement without anxiety or upset.
Role assumption – actively exercises the leadership role rather than giving leadership to others.	*Demand reconciliation* – reconciles conflicting demands and reduces disorder.
Persuasion – uses conviction and argument effectively.	*Predictive accuracy* – exhibits foresight and ability to predict outcomes accurately.
Superior orientation – maintains cordial relations with superiors and strives for higher status.	*Integration* – maintains a close-knit organization/team and resolves intermember conflicts.

Several researchers claim that working in a highly virtual context increases the importance of task-oriented leadership (Bell and Kozlowski, 2002; Davis, 2004, Griffith & Meader, 2004, as cited in Zimmermann, Wit and Gill, 2008). In addition, Zimmermann et al., (2008) found out in their study of leadership behaviours in virtual teams that most task-oriented leadership behaviours as well as relationship-oriented leadership behaviours were perceived by team members to be somewhat more important in virtual than in face-to-face communication settings.

Plus, Zimmermann et al.'s study (2008) concluded that most task-oriented leadership behaviours become more important as the degree of virtualness in the participants' daily work increases.
Cogliser, Gardner, Gavin and Broberg (2012) observed in their study of 243 participants working in 71 virtual teams that members who were task-oriented were perceived by their teammates to contribute more to team's performance, while social-oriented members were not seen as contributing to team's performance. Moreover, there was no evidence that the more people got involved in relationship-oriented activities, the more other members saw them as being trustworthy. Surprisingly, the authors found out that virtual teams with high levels of task-oriented leadership performed particularly well, while social-oriented leadership had no effect on performance.
However, the contingency theory of leadership does not recognize a classification of leader behaviour, but instead claims that the task and relationship orientation of the leader is highly dependent on the context and situational factors, such as task and organizational conditions (Yoo & Alavi, 2004). Even if highly relevant, the theory has not managed to capture all leadership situations in order to explain leadership effectiveness.
Concerning virtual teams, computer-mediated technology reduces non-verbal communication, thus translating into the leader focusing more attention on task and creating a more task-oriented environment (Yoo & Alavi, 2004). The challenge, however, is that project leaders have to be both relationship and task oriented in order to face the challenges of the different project stages. Since attaining the final goal of the project is critical for project success, leaders should take into account that goals are achieved through people, thus people becoming vital resources for projects (Nauman & Khan, 2010).

Moreover, Hart and McLeod (2003) found out as a result of their field study that socio-emotional relationships or a people oriented leadership behaviour in virtual teams are built through intense and frequent task-related messages, rather than messages with "personal contents". This is consistent with the idea that leaders manage emotions by adopting a task-oriented behaviour that reduces ambiguity among team members and provides guidance for completing the tasks (Misiolek, Crowston, & Seymour, 2012).

Finally, Misiolek et al., (2012) explain the above differing views on leadership behaviour by assuming that virtual team dynamics and leadership dynamics differ in teams that interact for longer periods of time and are involved in work that is characterized by continued product development and innovation.

2.2.3 Shared leadership

Shared leadership represents a vital element in the modern organization world, being perceived as most effective when tasks are independent and complex (Pearce, 2004). It can be defined as the distribution of leadership influence among multiple team members, rather than focusing on a single designated leader (Carson, Tesluk, & Marrone (2007). Shared leadership is a multidirectional, dynamic, simultaneous and on-going process characterized by the emergence within the team of two or more members as leaders (Bergman, Rentsch, Small, Davenport, & Bergman, 2012).

Shared leadership is thought to be particularly relevant for virtual teams, since team members are separated from the team leader and from each other, which leads to a need of a distribution of leadership functions (Shuffler, Wiese, Salas, & Burke, 2010). Scholars have argued that shared leadership is the most suitable form of leadership for virtual teams since it is presumed to create stronger bonds among team members, cohesion, trust and commitment due to collaborative decision making and shared responsibility (Hoch & Kozlowski, 2012). Therefore, shared leadership would help mitigate the disadvantages of working in a virtual setting (Pearce & Conger, 2003). It is acknowledging that in a dispersed team, one individual might be unable to fulfil all the leadership roles that might emerge during the lifetime of a virtual project team (Ryan, 2007). Concurrently, Hoch and Kozlowski (2012) argue that team members do not necessarily need to perform the same leadership behaviour as their manager; rather shared leadership should be seen as the extent to which team members behave in ways as to spur the team processes which determine team performance. Furthermore, Shuffler et al., (2010) claim that, when leadership functions are distributed among team members, identifying and selecting members for virtual teams becomes not simply a factor of which skills are relevant for the task to be performed well, but also of the skills necessary to perform leadership functions.

Carson et al., (2007) point out that there are specific factors that support the development of shared leadership within teams, such as shared purpose, social support and voice to foster a positive environment. This means that sharing leadership responsibilities is possible in an environment characterized by a clear direction understood within the team, a strong sense of mutual support to encourage team members and a high level of voice and involvement.

Even if prior findings claimed that shared leadership is more important under greater degree of virtuality, Hoch and Kozlowski (2012) revealed in their study that shared team leadership enhances team performance regardless of virtuality. Additionally, there has been considerable effort to prove that shared leadership is more than a supplement to team functions or just analogous to hierarchical leadership (Pearce & Sims Jr., 2002). Shared leadership appears to have the potential to be a strong leadership approach on its own for team performance and specifically for virtual teams' effectiveness.

Finally, with the above theoretical framework on virtual leadership we could identify the existing gap in the current literature concerning task and relationship-oriented behaviour for effective e-leadership. The contrasting views on the balance of these leadership behaviours as a result of quantitative studies directed us towards carrying out an exploratory study to identify how these behaviours differ or should differ compared to leadership in a traditional setting. Therefore, our RQ3 intends to assess how leadership behaviour is different in virtual projects compared to face-to-face projects.

CHAPTER 3

Methodology

In this chapter we discuss the research methodology and design that shape our study and which are based on the 'research onion' as presented by Saunders, Lewis and Thornhill (2012).

First, we present our research philosophy and approach to theory which influence the way we address the research questions.

Next, we uncover our methodological choice, which represents a concurrent mixed methods research, our research strategy which combines both qualitative and quantitative techniques and our time horizon which is cross-sectional. Furthermore, we discuss our data collection and data analysis techniques.

Finally, we address the ethics and the quality of our research design and discuss the limitations of our study.

The research methodology, which can be defined as our approach to the entire process of the research study (Welman, Kruger, & Mitchell, 2005) is determined by our research problem. As mentioned in Chapter 1, the purpose of our study is to explore leadership in a virtual setting, purpose which was broken down into three research questions that influence the way we conduct the study. In order to get a more complete understanding of our research questions, we decided to integrate two forms of data, collected from project managers working in a virtual environment and their project team members.

Next, we present our research methodology by following the layers of the "research onion" as introduced by Saunders, Lewis and Thornhill (2012).

3.1 Research philosophy

The philosophical worldviews, even though hidden in research, still influence the practical aspect of the study and need to be identified (Creswell, 2014).
According to Saunders et al., (2012), there are four research philosophies in business and management research: pragmatism, positivism, realism and interpretivism. All these philosophies can be analyzed from an ontological, epistemological, and axiological point of view, which in the order presented, constitute the researcher's view of the nature of reality, the researcher's view regarding what constitutes acceptable knowledge, and the researcher's view of the role of values in the research study (Saunders et al., 2012).

Derived from our research design and purpose, we confirm to the idea that the reality observed through this research study is not a given reality, but is constructed by different 'actors'; in our case by the project leaders interviewed. Moreover, by addressing our research purpose, we aim to create *understanding* of virtual leadership from the interior, starting from the meanings project leaders assign to this phenomenon under study. Therefore, our position within the research is associated with the epistemological stance of interpretivism. Weber (1947) cited in Bryman (2012, p. 29) referred to it as a "science which attempts the interpretative understanding of social action". Hence, we as researchers provide an interpretation of leaders' own interpretation of virtual leadership; and according to Bryman (2012), there is the third level of interpretation, when researchers' interpretations are further interpreted in terms of concepts, theories and literature.

Ontologically, our position relates to subjectivism that asserts that social phenomena are a construction of the perceptions and actions of social actors (Saunders et al., 2012). Likewise, we put much emphasis on the way in which project managers attach their own meanings to their role as virtual project leaders and the way they think this role should be performed. Additionally, we rely on their perceptions in terms of project success and effectiveness.

Axiology is highly relevant for the ethical context of the research (Saunders et al., 2012). In our study, values play a significant role for knowledge creation. Moreover, as Hiles (2008) puts it, in social sciences research, values are seen as unavoidable in shaping the research outcomes.

3.2 Research approach

In terms of research approaches, Saunders et al., (2012) introduce three types of reasoning: deduction, induction, and abduction, depending on the degree of explicitness of the theory in the design of the research - from theory driven to empirically driven. For our research study, we applied the abductive approach which is based on collecting the data to identify themes and patterns aimed at modifying an existing theory or generating a new one that might be subsequently tested through additional data collection (Saunders et al., 2012). Dubois and Gadde (2002) describe the abductive approach or otherwise called, systematic combining, as a constant move of the researcher "back and forth" between empirical observations and theory. By focusing on this approach, we are able to expand our understanding of both theory and empirical phenomena.

The abductive approach used for this study is presented in Figure 3.1, based on the process employed by Lundin and Norrman (2010) in their study. First, we defined our purpose which explores leadership in a virtual setting based on gaps in theory. Then we developed the conceptual frame of reference, which covers perceived project success, challenges of working with virtual teams, leadership behaviour in a virtual setting and trust building. Having developed categories from the conceptual framework, we collected the data by means of triangulation. Based on the empirical data, we identified new dimensions which we included in the conceptual framework, therefore revising the frame of reference. Finally, we analyzed the data, presented our findings and subsequently, built on the existing theory.

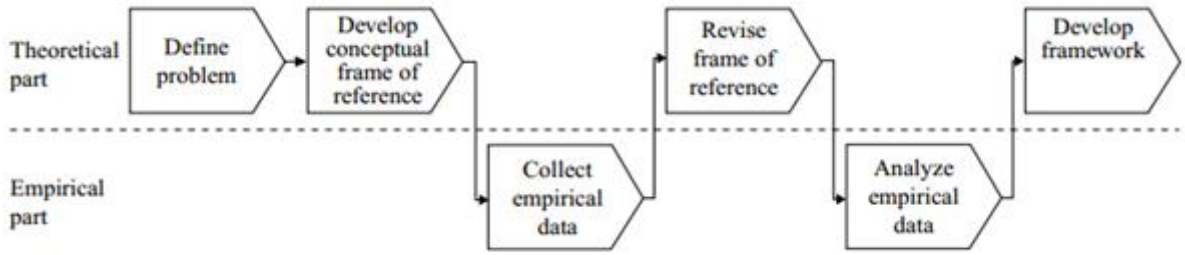


Figure 3.1: The Abductive Research Process Employed in this Study (based on Lundin & Norrman, 2010, p. 284).

The main objective of our research study is to "confront" theory with the empirical world and finally contribute to theory building. Therefore, by using the abductive research approach we believe we can yield more in terms of final results as we continue to revise and adjust along the way of the research.

3.3 Methodological choice

To fulfil the purpose of this study, we need to obtain a more complete picture of the phenomenon of leadership in a virtual setting. As leadership behaviour and trust building influence and are influenced by two parties, leaders and followers, using both qualitative and

quantitative methods concurrently offered us two valuable perspectives, with one being used in a supporting role. Therefore, the concurrent triangulation design employed in this study provided us with richer and more comprehensive responses to our research questions. As defined by Saunders et al., (2012) a concurrent mixed method consists in the use of both quantitative and qualitative methods within a single phase, but collected separately.

According to Lund (2012) mixed methods research may provide more valid inferences. In our study, the validity of our inferences increased by means of comparing the empirical data collected qualitatively from project managers, with the empirical data collected quantitatively from the project team members. The latter results were confronted with the aim of observing convergence or divergence in terms of leadership behaviour and trust building as manifested and perceived by leaders and team members respectively. In addition, as Hurmerinta-Peltomäki and Nummela (2006) assert, the mixed-methods approach is essential in cross-cultural studies.

3.3.1 The nature of the research design

According to Saunders et al., (2012) the way the research questions are being asked involves the researcher in either an exploratory, descriptive or explanatory study. The nature of our research study derives from the way we formulated our purpose of exploring leadership of project managers in a virtual working environment. Therefore, we aim to gain meaningful information of virtual leadership of project leaders; our purpose being best addressed by an exploratory study which is intended at finding out "what is happening; to seek new insights; to ask questions and to assess phenomena in a new light" (Robson, 2002, p.59). For our exploratory research, we chose to conduct semi-structured interviews with project managers, which gave us the advantages of more flexibility and adaptability with the help of follow-up questions. Hence, we gained new insights along the way which expanded our theoretical framework and allowed us to incorporate parts that did not occur to us or were considered trivial at the beginning.

3.4 Research strategy

The choice of a research strategy depends on the research purpose, questions, philosophy and approach (Saunders et al., 2012). As mentioned in the methodological choice, we employ within our study the mixed methods research, which further leads to also combine a number of different strategies to answer our research questions. Since combining both qualitative and quantitative research, we used two different strategies accordingly.

For our qualitative research, the case study strategy has been applied. Yin (2009, p.18) defines a case study as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident". Therefore, our aim by using the case study strategy is to grasp a holistic understanding (Diaz Andrade, 2009) of the phenomenon of virtual leadership in a relatively new area of research

In addition, besides applying the case study strategy, we also *triangulate* multiple sources of data, semi-structured interviews and questionnaires. Although the case study strategy has an independent role in our mixed-method study, the findings from both interviews and

questionnaire converge in later phases where the results are integrated and interpreted (Hurmerinta-Peltomäki & Nummela, 2006).

Yin (2009) distinguishes four types of designs for case studies:

- single case versus multiple cases;
- holistic case versus embedded case.

Limiting this categorization to our study, we mention that our research has employed a multiple-case design, having used multiple sources of information. According to Saunders et al., (2012) a multiple case study approach is used for its capacity to demonstrate a certain form of replication, literal replication (predicts similar results) or theoretical replication (predicts contrasting but anticipatable results). This means that within our study, more cases were included with the assumption that similar results would be found.
Additionally, our case study design can be described as embedded. The explanation resides in the fact that it involves more than one unit of analysis (seven project leaders) and it is not limited to qualitative analysis alone, but it employs the triangulation method correspondingly.

With the objective of contrasting views and draw conclusions, we also apply the survey strategy using questionnaires. Moreover, we use the survey strategy to improve the robustness of our research, to acquire a deeper understanding of virtual leadership and favourably, to add to the existing knowledge base (Hurmerinta-Peltomäki & Nummela, 2006).

3.5 Time horizon

In terms of time horizon, our research study is cross-sectional, since we aim to explore the leadership of project managers in a virtual environment at this particular moment in time. Therefore, according to Saunders et al., (2012) our study represents "a snapshot" which we obtain by collecting data only once and in a short period of time (1 month). Unlike longitudinal studies that focus on change and development over time by following the same group of informants, we focus on collecting data based on prior experiences that influence the *current* leadership of project managers in a virtual setting (Payne & Payne, 2004).
Even though cross-sectional studies have their own limitations, such as the possibility of not collecting all the relevant data based on the past experiences or in case two factors are associated, the impossibility of telling which one is causing the other (Payne & Payne, 2004), we found that a longitudinal study was not feasible due to constraints in time and resources.

3.6 Data collection

3.6.1 Semi-structured interviews

In our data collection process we collected primary data using qualitative interviews to detect the meanings the respondents attached to leadership behaviour and trust-building in a virtual setting. Unlike the unstructured interviews that may not have any specific questions or topic list to be covered, the semi-structured interviews we opted for, contained a list of more precise questions

(Appendix 1) (Blumberg, Cooper, & Schindler, 2011). The semi-structured interviews gave us the advantage of being sure we covered the necessary areas for our research, as we had an idea of the important aspects we needed in order to create an understanding of the themes under investigation: perceived project success, leadership behaviour, and trust-building. Also, semi-structured interviews were used with the aim of improving the comparability of the answers, but keeping however a flexible structure which allowed to ask additional or follow-up questions (Blumberg et al., 2011).

As shown in Appendix 1, our interview guide contains open questions to encourage project managers to describe their experiences as virtual leaders, possible follow-up questions to elaborate further on a specific question, and possible probing questions aimed at obtaining more information related to a part of the interviewee's answers.

We conducted 7 semi-structured interviews that lasted from 45 minutes to 1 hour and 13 minutes, as presented in Table 3.1. The difference in the interview length resides mainly in the different level of English of project leaders; besides Sean Watts, for all the other respondents English was their second language. However, the difference in length could also consist in the different setting that the interview was conducted (face-to-face vs. virtual) and the sometimes slow internet connection for the virtual interviews.

Table 3.1 Overview of the Interviews

Respondent	**Current Company**	**Position within the company**	**Date**	**Length**	**Setting**
Maria Forss	Vitrolife Sweden AB	Vice President Business Development and Global Marketing	2014/03/12	1:09:38	Face-to-face in Gothenburg
Ulrika Allgén	Astra Zeneca	Clinical R&D	2014/03/14	1:13:38	Face-to-face in Gothenburg
Mattias Holgerson	SKF	Project Manager R&D Office	2014/03/17	0:53:44	Virtual via Skype
Sean Watts	SKF	Programme Manager, Manager IB Project Management Office	2014/03/18	0:45:49	Virtual via Face Time
Erik Woerdeman	SKF	Project Manager Automotive Development Centre	2014/03/19	1:13:05	Virtual via FaceTime
Rickard Westerberg	Sandvik Argentina	Project Manager, Sandvik Argentina SA, Project Office	2014/03/19	0:57:01	Virtual via GoToMeeting
Antonio Vizzino	SKF	Project Manager, Specialist IB Project Management Office	2014/03/21	0:59:03	Virtual via FaceTime

In order to overcome interviewer bias, we made sure the interview themes were developed in advance and the questions asked were neutral and free from personal beliefs, as far as possible.

Also, the interviewee bias was eliminated by avoiding questions that would intrude on sensitive information, such as individual financial rewards or pointing to what other interviewees from the same organization have said before the respective interview, since according to Saunders et al., (2012) interviewee bias may occur when interviewees have to answer sensitive questions that they do not wish or are not empowered to discuss.

3.6.2 Questionnaire

Our qualitative research is complemented by collecting primary data using a target Web-based questionnaire. The questionnaire was designed for the project team members with the aim of confronting project managers' description of their leadership against team members' perception concerning managers' leadership, so that to obtain richer and more comprehensive findings. The questionnaire employed represents a combination of list questions, category questions and rating questions (Likert-style rating on a 5-point rating scale – "Strongly disagree", "Disagree", "Neutral", "Agree", "Strongly agree"). The advantage of using the Likert scale is that participants are not forced to take a stand on a particular question, but rather respond in a degree of agreement. Moreover, the questions are easier to understand and quantify (LaMarca, 2011). We organized the questions in a logical flow starting from general questions concerning the virtual team and project success and going to more specific questions concerning leader's behaviour and trust achievement within the team. The reason of grouping the questions lies in reducing the cognitive burden of the participants, but also in following the same configuration we developed for the semi-structured interviews, since it would facilitate the analysis of results and comparability.

Since a high response rate is essential for ensuring the representativeness of the sample and the reduction of the risk of non-response bias (Saunders et al., 2012), we calculated the active response rate (ARR) of our report as suggested by Neumann (2005) and presented in Saunders et al., (2012):

$$\boldsymbol{ARR\ (58.18\ \%)} = \frac{Total\ number\ of\ responses\ (32)}{Total\ number\ in\ sample\ (56) - (Ineligible\ (0) + Unreachable\ (1))}$$

Therefore, the active response rate was 58.18 per cent. Because of lack of direct access to the respondents and impossibility of fully controlling the process of sending out the questionnaire to the participants, we insisted with sending 4 reminders at an interval of 7 days to the project managers who were responsible to further the reminders to the project team members. We did so in order to enhance the response rate.

From the total number of the responses obtained, all 32 were deemed as valid and fully completed. None of the responses was disqualified.

According to Fincham (2008), a response rate approximating 60% should be the goal of the researcher, thus the 58.18 % achieved in our case would be considered valid and reliable. Also, the survey strategy was used within our research as a complement to our qualitative study, and we believe that the obtained response rate would suffice to give strong indications to our research questions.

Finally, the triangulation method of using both qualitative interviews and the survey strategy complements and adds a new dimension to the previous research concerning virtual leadership.

3.7 Data analysis

The analysis of qualitative data is likely to be large in volume and complex in nature (Saunders et al., 2012). Our semi-structured interviews lasted from 45 minutes to 1 hour and 13 minutes, were audio-recorded with the participants' consent and subsequently transcribed, which resulted in 62 pages of raw data. However, the raw data, which is referred to by Miles and Huberman (1994) as extended text, was unreduced, poorly ordered and difficult to analyse. Therefore, our first step in data analysis was to simplify the data and condense it, a process identified by Miles and Huberman (1994) as data reduction. One method that facilitated our data reduction was theme identification, which is considered by Welman et al., (2005, p.211) as "one of the most fundamental tasks in qualitative research". Hence, as part of our interview guide and previous to data collection, we identified the following overarching themes or else called "umbrella constructs" (Welman et al., 2005): *General working characteristics of the interviewee, Characteristics of the team, View on virtual teams, Project success, Task-oriented leadership behaviour, Relationship-oriented leadership behaviour* and *Trust-building*. These themes were formulated in accordance with the research purpose and questions. Next step in the data analysis was unitising the data, attaching relevant chunks of textual data to the appropriate category. Further, we subdivided the data that attracted too much information conforming to the theoretical framework and then, based on Miles and Huberman (1994), we recognised relationships and patterns within the data. Last, we draw conclusions from the relationships we identified, we verified our findings by confronting them to the theoretical framework and reported our interpretations.

Additionally, we employed both within and cross-case analysis as part of our study. The within-case analysis was used to immerse into all individual interviews so that to identify significant statements according to our preliminary theoretical categorization (Ayres, Kavanaugh, & Knafl, 2003). Next, these statements were compared across cases in order to identify resemblances and dissimilarities, therefore following a cross-case analysis. According to Ayres et al., (2003) the basis of analytic generalizations in a qualitative study is to look *at* and *through* each case.

The analysis of the survey using questionnaires was performed according to the type of questions included: list, category and rating questions. Since using online questionnaires on Surveygizmo.com, the software already integrates the analysis of the data collected, which means that the data collected by means of list and category questions is presented in the form of tables/frequency distribution, bar and pie charts. Therefore, we show the frequency of occurrences of the registered values, so the results are ready to read and compare among the team members within the sample.

For the analysis of the Likert scale, for this particular study we consider the Likert-type items as interval level data (Boslaugh & McNutt, 2008). Therefore, we used the mean (M) and standard deviation (SD) to describe the data and draw conclusions. The mean gave us the average answer of the respondents and the standard deviation (SD), the indication of the average distance from the mean (University of Northern Iowa, 2010). Accordingly, a low standard deviation means that

the responses cluster around the mean, and a higher standard deviation shows a lot of variation in the answers. Moreover, we chose to use pie charts of the frequency of responses to report the data obtained, due to the simplicity in showing the differences between categories ("Strongly disagree", "Disagree", "Neutral", "Agree", "Strongly agree").

3.8 Research ethics

Ethics addresses the question of how to conduct research in a moral and responsible way and how to compromise between what theory recommends and what is feasible from a practical point of view (Blumberg et al., 2011). According to Denzin and Lincoln (2011) researchers should follow four ethical guidelines: informed consent, avoidance of deception, privacy and confidentiality, and accuracy.

Within this study, we obtained the consent of the participants by stating beforehand the duration of the interviews, the purpose and methods of the research study. Therefore, based on full and open information, the project managers agreed voluntarily to participate in the study. In this way, we managed to eliminate deception as well, since Blumberg et al., (2011) claim that deception happens when the participants are told part of the truth only or the truth is fully compromised, so that to get data not obtainable by other means.

Privacy and confidentiality represents one aspect that was carefully considered in our research. As one of the ethical guidelines states, we as researchers have to protect people's identity against unwanted exposure (Denzin & Lincoln, 2011). Hence, for our qualitative study, after carrying out the interviews, each of the participants was asked if they want their identity to be revealed or want to stay anonymous. As a result, the participants thought the interview questions did not undermine any of their personal or professional standing and agreed to have their names and positions disclosed.
Even though the respondents of our research study agreed to have their names revealed, due to the fact that some of the respondents work for the same organisation, for the purpose of reporting the findings we decided to assign each interviewee a letter from A to G randomly. Therefore, the letters are assigned in a different order than in Table 3.1 and the main reason to have done so resides in avoiding to point out explicitly to what a particular project manager mentioned during the interview. Thus, we address the ethical principle of avoidance of harm to the respondents that might have resulted in embarrassment, stress, discomfort or conflicts (Saunders et al., 2012). Concerning the quantitative study, we ensured each participant that their anonymity would be secured and data obtained would be protected, so to increase the participation rate and obtain more valid results.
Moreover, we ensure that our data is reliable and the findings reported in a rigorous manner, irrespective of whether they might contradict expected outcomes.

- **Gaining access to data**

In our research study we have combined two types of access: traditional and Internet-mediated access, the combination of these two being defined by Saunders et al., (2012) as a hybrid access. First, even though gaining access to data often poses great difficulties especially to external

researchers, the request to access and cooperation interested the gatekeeper of our research ("the person who controls the research access" as defined by Jupp (2006)), who added credibility and introduced our research project to the project managers. We were granted access with the promise of offering a summary report of the research findings to the interested parties. However, due to the tight schedule of the project managers, the number of the semi-structured interviews was limited.

As part of our Internet-mediated access, the questionnaire was sent as a hyperlink within an email by the respective project managers to their team members. In this way, we ensured we would have a higher response rate and reduce the risk of non-response bias (Saunders et al., 2012).

3.9 Research limitations and reflections

The first limitation of our study is that the sample is not large enough to include managers involved in projects of different types, complexity, length or industry. Also, we did not take into account the differences between office and home virtual settings which might have influenced leadership in a different way.

The second limitation consists in relying solely on project manager's perceived success in order to reveal the effectiveness of their behaviour, which might have led to the exclusion of other relevant success indicators not mentioned during the interviews. However, we tried to overcome this limitation by including team members' perception on defining project success.

Third, four of the project managers interviewed detain a position within the same company group, which might create a certain bias, since their leadership might be similar as a result of the influence of the same organizational culture. However, the managers were involved in and led different projects in different locations.

Additionally, the interviews were conducted in English, which was not the native language neither for us as researchers nor for the interviewees. This might have resulted in challenges concerning the transfer of meaning, but also in loss of meaning or misinterpretations. According to Nes, Abma, Jonsson, and Deeg (2010), expressing experiences in words is a difficult process, and it gets more complicated when individuals have to express them in a non-native language, since language influences how meaning is constructed. In order to overcome this limitation, during our interviews the language we used was reduced to a simpler and more comprehensible way of communicating, avoiding difficult-to-grasp academic language. Also, in case of doubt, we tried to clarify the respondents' statements or to extend the meanings of their assertions.

Also, when assessing trust-building in virtual teams, we solely rely on the stage model of Greenberg et al., (2007) therefore, important models or studies may have been excluded from this research.

Furthermore, in building the questionnaire, the questions used might not have entirely reflected the team members' understanding of the same issues addressed. Moreover, in calculating the sample size, worth mentioning is that in some cases the project leaders sent the questionnaire link to the core team members only, the core team being much smaller in size. Fincham (2008) asserts

that the larger the sample is, the more accurate the estimates of the study are. Therefore, we believe we could have obtained a more reliable response rate if the questionnaire could have been sent in all cases to the extended project teams.

We also acknowledge that interviews with the team members might have been more insightful and appropriate to sense how trust is built within teams. However, because of limited time, resources and access, the survey strategy was employed instead.

Finally, in the qualitative data analysis process we might have allowed our own subjective view to interfere with the interpretation of the participants' responses.

CHAPTER 4

Empirical Findings & Analysis

This chapter is divided into two parts. The first part addresses the findings and analysis of the semi-structured interviews with the Project Managers. The results and analysis are presented according to the following categorization derived from our theoretical framework: perceived project success, challenges of virtual projects, trust-building, and leadership behaviour.

The second part comprises the findings and analysis of the questionnaire sent to the project team members.

Our semi-structured interviews were conducted with seven project managers with previous experience in working with both traditional and virtual teams, the teams being characterized by different degrees of virtuality. More information about the project leaders' background is presented in Appendix 4.

Next, for each section 4.1, 4.2, 4.3 and 4.4, we present first the empirical findings as a result of the semi-structured interviews with the project managers, followed by the corresponding analysis.

4.1 Perceived project success

Empirical findings

Concerning project success, the respondents perceived it in two slightly different ways, some emphasizing as equally important, time, budget and quality and some finding acceptable a less strict view. For example, Respondent C & Respondent A mentioned that project success was mainly about how much of the deliverables the team has achieved within the time, budget and quality planned and agreed upon. On the other hand, Respondent E addressed that the most important was to deliver what the receivers expected and if the project was going to be within time and budget was a secondary measure. Moreover, other respondents emphasized the importance of managing expectations and having the courage to change the project along the way as success factors for virtual projects. For instance, Respondent G claimed that *"change is the key; to be able to acknowledge, manage and implement it, is the key for success"*. Project success is also when the project leader has the courage to stop a project or change the scope of a project (Respondent D) and so remove the potential waste of money and time (Respondent G).

As part of achieving project success, some of the respondents talked about the priority of having a clear goal and of managing the soft values within the team. Therefore, Respondent D mentioned it was important *"to bring enough clarity and certainty in an objective sense that the team members themselves will recognize whether they have succeeded or not"*. Respondent A emphasized the same idea of having clear goals and objectives in order to make the team members run in the same direction.

Furthermore, failing to be within time for the project deliverables did not mean the project was unsuccessful. The timeline for the project was put down more as an ambition rather than the reality (Respondent D). Similarly, Respondent E acknowledged:

"*Delays are in a way always treated a bit as a failure which somehow it's not. If I need a year more because I encountered or learnt stuff we did not know before it is not a failure. In fact if we would have been blind for those issues we should have failure*".

Analysis

In our interviews with the project leaders we relied on finding out the factors that in their perception contributed to project success and how they finally defined project success. The end-measurables of time, budget and quality (Kendrick, 2012) for project success mentioned in our theoretical framework were perceived by project leaders as the traditional way of measurement; but they acknowledged that attaining the main objective of the project was the most important

success factor that they took into account, in spite of whether the criteria of time and budget were met. Also, the project leaders outlined the importance of the intra-measurables in assessing project success, such as leader's behaviour, communication, managing expectations, having the courage to stop or change the scope of the project as a way to remove potential waste of resources. Therefore, the emphasis on intra-measurables confirms that qualitative variables are also critical for success (Lee-Kelley & Sankey, 2008).

Finally, in assessing the effectiveness of project leaders' behaviour, opting for *perceived* project success was the best choice as confirmed by our empirical findings, since success was seen differently by project managers, relying on their own experiences and other external factors that might have influenced their perception.

4.2 The challenges of working with virtual teams

Empirical findings

4.2.1 Technology and Communication

All the respondents mentioned during the interviews the challenge of technology in achieving effective communication. Also they emphasized the difference related to co-located teams. For example, Respondent G said that the biggest difference between a co-located team and a virtual one was the mode of communication but especially the immediacy of communication. Accordingly, Respondent A and Respondent G emphasized the importance of focusing on communication to make it work virtually and also of finding a way to communicate directly to the different team members. Another aspect captured as vital was the need of implementing and maintaining a communication strategy plan.

According to Respondent B, the members of a virtual team tend to rely very much on email and written communication of different kinds, especially if there are people coming from different cultures and having different experiences. Usually, the communication tools were sometimes not enough to make every member feel part of the team and therefore, it was even more important to travel to those members in order to discuss potential issues (Respondent G). Also, technology meant higher possibility of miscommunication (Respondent F).
The most frequent tools mentioned by the respondents to be used in their daily communication were the phone, the email, the video conferences from time to time, and the chat in one case (Respondent F). The phone and email were still the preferred ones among the respondents, the video conferences being used for more important issues and when the project leaders felt the need of observing the body language as well. The chat was recommended by Respondent F as a good way of eliminating the language barrier, but it had the disadvantage of often becoming overwhelming and distracting because his/her laptop was always popping out with chats.
Additionally, Respondent E stated that:

"*Everything within a virtual team needs to be arranged, you can´t have the coincidental talk at the coffee machine or during lunch, you need to organize all meetings which in a way hinder the input of creativity because not every bright idea comes at the moment you have a meeting*".

Communication was seen as time and energy demanding by the project leaders: "*it can take time to communicate within a virtual team since there might be a bit of delays and some lagging in communication*" (Respondent C). In order to facilitate communication, sometimes, the project leaders used their own communication tools even if they were not really endorsed by the organization. In this sense, Respondent G mentioned that he/she preferred to run the risk of leaking sensitive information rather than shutting down communication.

4.2.2 Cultural differences

According to the respondents it is not just the culture itself that might be a challenge, also the language might be a barrier and so the different time zones. According to Respondent D, culture divides a team as much as distance and Respondent A mentioned that culture is just a filter you need to be aware of. Therefore, if you acknowledge that there is a cultural difference within the team, you can make the best use of it (Respondent G). Moreover, Respondent E admitted that cultural differences affected the project to a certain extent and it should be taken into account:

"If you ask someone to paint your wall white, some people will do it perfectly and it will be perfectly white and not spoil anything on the wall next to it and other people will make a mess out of it and still say that the wall is white; but in the end it is not the same" (Respondent E).

According to Respondent E you have to really define what you want in terms of goals, especially knowing that the cultural differences in some areas can make a big difference. Subsequently, Respondent A mentioned that if he/she had to start the project once again he/she would want the members to repeat what he/she said and understand it, since sometimes they just said yes without understanding what he/she meant and it became wrong later on. Also Respondent F emphasized: "*you can read a bit about culture and you can listen to people who have been there [to the specific country] but in the end I think you need to be physically there for a while and get to know the culture*". According to Respondent C and Respondent E being successful was about being open minded, not judging, and experiencing things; it was mainly about experience, doing by learning and learning by doing. Respondent D exemplified:

"Working with India, on a very humorous basis we introduced the policy of 5 YESes and not 5 WHYs, because we´ve found with India, if you ask a question, no one will ever say no; it`s part of the Indian culture, they will always say yes".

Respondent D claimed that it was a good idea to have benefited from a cultural sensitization training to expand the knowledge about culture.

Even if in our research study we do not specifically focus on the language and time-zone barriers, we found out as a result of the interviews that language was an important challenge for communication in virtual teams that affected the perceived success of projects: "*there is a problem with misunderstanding within projects where the English speaking level is low*" (Respondent B). Also, as Respondent F put it: "*if you have a situation when there is a gap in the language knowledge, you need to be in the same room because you need to draw pictures and show with hands to really understand each other*". Therefore, the body language gets more and more important as the gap of knowledge in the

language is growing, according to Respondent F. Likewise, the differences in time zones were handled by the project leaders through compromising on their availability. They mentioned to have separate meetings in order to get in touch with the whole team:

"*Sometimes you need to sacrifice by getting up early in the morning and staying late in the evening, but you have to do it to be able to keep up with the office hours in the different time zones"* (Respondent C).

Therefore, they put themselves in the uncomfortable situation of taking meetings in the middle of the night or during the weekends (Respondent G). *"So unless you´re prepared to make yourself available in different ways, you will lose touch with the teams*" (Respondent D).

4.2.3 Conflicts

Conflicts were perceived by project managers as being both a barrier and an enabler. Mainly, the respondents admitted that conflicts were inevitable and that they occurred as a result of stress, misunderstandings, missing of deliverables and wrong management of expectations:

"*When there is a conflict it is most likely coming from the fact there has not been an agreement of what the expectations are and there has not been a clear agreement of what we are doing and why*" (Respondent G).

Also, Respondent F admitted having conflicts all the time, especially when getting closer to milestones and people got more stressed. Respondent G also added that conflicts within the team happened because of stress, because people felt that they had more responsibility than they could carry on. However, the project leaders mentioned that conflicts might also be a positive thing:

"One of the things I learned is that you need some friction to make things sharp. So in a way some frictions and conflicts are needed to really understand why he or she says no or why he or she says: I cannot do it, or: I´m frustrated" (Respondent E).

Moreover, Respondent D asserted that even if it was hard to believe, a lot of conflicts actually lead to a maturity increase: "*so when a team is being together through very demanding challenges, they often come out the other side stronger*".

Analysis

Technology and Communication

In our frame of references, Jansson (2005) mentioned that the barriers to successful communication in virtual teams consist in the functional failure of the technology and the need for team members to learn how to use certain technologies. From our empirical findings we conclude that projects leaders felt there was a lack of trainings concerning how to use the technology meant for communication and that they heavily relied on old methods such as phones, emails and video conferences in more special situations (first meetings, critical issues to solve). Therefore, we also confirm another theory that says that individuals focus on technologies

that they know well, not particularly because it is the best way for a certain situation, but because it is convenient and does not require much initial effort in utilizing it (Jansson, 2005). This statement is also endorsed by one of the project leaders who mentioned: "*I think we should make more use of the video system that is in-house but I am an old guy so I hesitate to sit in front of the camera and make use of that*". Additionally, most of the respondents pointed out to the lack of an alignment between the technologies or internet coverage of the companies the leaders worked for and their partner/customer companies, or even among the team members dispersed. Referring to Figl and Saunders (2011), this means a low synchronicity of the technology which does not allow members to work effectively at the same time on the same task.
Finally, according to Figl and Saunders (2011) the technology used by our project members can be described as having low social presence and low richness and synchronicity. These findings are more surprising as the projects led by the project leaders were in the innovation and IT sector and also because of the high-technology world we are witnessing today.

Likewise, Rothbard & Pottruck (2013) address in the theoretical framework the idea that virtual communication may result in misunderstandings or loss of valuable information. Our findings support this theory, project leaders mentioning that virtual communication resulted in loss of bright ideas and represented a hinder to creativity because they were always arranged.

Cultural differences

In the frame of reference, according to Kerzner (2009), cultural differences can create more robust outcomes and distinctive advantages for those team leaders and team members who understand and are sensitive to the differences and also use it in a positive way. Our findings show that leaders particularly highlighted the importance of being *aware* of the cultural differences and being aware of it as a dominant factor affecting virtual teams. Also, in the literature we address Hafstede's five cultural dimensions which may have a great impact on the way members perceive things within the team. From all five, the project leaders outlined power distance as the most critical when it comes to the way members communicate. Moreover, cultural differences forced project leaders to be more explicit about the project goals but also monitor more often in order to see if the members were indeed clear about what they had to do as it seemed at the beginning. In our empirical findings we also came up with examples that support how culture can increase the complexity of leading virtually.

Furthermore an additional challenge which was not referred to in the theory was the language barrier that somehow is connected and influenced by culture. For some of the project leaders, language kept appearing as a significant variable that influenced the advancement of the project. According to them, there are cultures that have a low English level which emphasizes the leader's importance of language knowledge, since most of the time, with some of the team members the leader had to speak the local language. Otherwise, the language barrier might have caused greater misunderstandings that in the end may have caused failures.

Additionally, our results show that it is truly important to learn by doing but also to get knowledge from others that already have done business within a certain culture so that to

enhance leaders' cultural intelligence and sensitivity. Cultures are distinct and project leaders underlined the importance of not judging the differences, but trying to learn from them instead.

Kezner (2009) explains in the frame of reference the importance of creating a team culture in which differences and problems can be discussed and surfaced. However, the project leaders did not address the importance of building a special team culture, due to lack of time and complexity of communication.

Conflicts

In the literature, Ferrazzi (2012) explains that there are two types of conflicts: task related and relationship related conflicts. In our findings we see that conflicts are common and the respondents are quite used to deal with them. We also noticed that the conflicts that project leaders described were mainly task-related, occurring because of wrong management of expectations and high level of pressure as a result of the difficult-to-handle workload when approaching certain deadlines.

Additionally, our research findings show that conflicts had a positive impact on the project effectiveness and performance because they contributed to the team members growing stronger together and also understanding people and what was behind the surface. These findings confirm the theory by Ferazzi (2012) that task-related conflicts can lead to more effective ways of doing things and result in being healthy for the team and project effectiveness.

4.3 Trust-building

Empirical findings

Stage 1: Concerning the planning stage, the project managers mentioned that the criteria on which the team members' selection was based were primarily the technical expertise and capabilities: "*we define the project and then we say I need certain skills, knowledge or experience*" (Respondent E). Other criteria identified included availability, political influence, and project management skills. None of the respondents recognized previous virtual project experience as a vital criterion for members' selection. Moreover, Respondent E added that: "*sometimes the reason to select somebody is to give him/her that experience*". Nevertheless, project managers do not choose the team members themselves:

"*The reality is that many times in the frontline-projects organizations we don't choose the people. So, normally what happens is that these big 3-5 years technology projects come with a project manager and a sponsor. The other resources let's say choose themselves somewhat based on the technology competence*" (Respondent D).

In terms of reward structure, some of the respondents mentioned having a cooperative structure rather than a competitive one and emphasized the applicability of recognition rather than that of monetary incentives (Respondent C, Respondent D, Respondent E, and Respondent G). However, project managers could not influence themselves the way the reward structure was shaped to motivate team members.

Stage 2: When describing initial trust, the project leaders emphasized the importance of creating a common purpose for the team. Respondent D mentioned giving the team a challenge in common, so that the team members recognize the need to rely upon each other to reach that challenge: "*it can be very unifying, you create something in common, either the challenge but also the prospect of success; trust is built through transparency, so get people to share how they see the challenge and what the obstacles are*". Furthermore, Respondent A claimed that at the beginning it is important to create a culture where people are respected for their experience and skills and have an understanding that there are no skills more worthy or more valued than others.

When the team is put together, most of the respondents found that introducing the members and their main achievements to the others might differ across projects. Respondent A brought in the cultural aspect saying that for some cultures, results and previous experiences were regarded as essential and should be formally introduced to each other, whereas for some other cultures, name and function seemed to be enough to share initially. On the other hand, Respondent E mentioned the lack of such practices for his/her projects and recognized the need for doing it for future projects. Respondent C acknowledged the importance of initial face-to-face meetings, when team members set the common values and introduced themselves to each other. Moreover, Respondent D claimed that: "*I find for people, especially in an ecosystem of culture, it is recognizing members' contributions publicly within the team*". Respondent G mentioned that lessons learned were included in the beginning of a new project and that within his/her team they did cross-projects take-aways in the belief that there were a lot of things that could be learned from each other between running projects.

All the respondents organized team building activities with their team members, on the occasion of their face-to-face meetings that consisted of running contests, coming up with a special nickname or song for the team, go carting, meeting for dinner or other outside social gatherings, bringing someone from outside to facilitate team-building events, or conferences customized into team interactions. Besides Respondent B that mentioned virtual quizzes as part of their team-building activities, the other respondents said that they had never organized virtual team activities. Moreover, Participant C mentioned a lack of team building activities because of the temporary nature of projects:

"*The thing with these virtual teams is that you form the teams, the project and you go away; it is more about forming over teams; you never come really to the storming and norming phase that are more about meeting and building trust - when you are coming to the storming phase, you are about to break up again*".

Besides Respondent D that mentioned behavioural norms within the team, all other participants' rules of engagement were more informal. Therefore, Participant G specified that they had no rules on when and how they should communicate, but that they had to communicate. Also, respondent E said they had some rules, but they were not followed properly. The same aspect was noted by respondent B who said that he/she tried to get people to talk to each other, but it was not 100% successful: "*many people want to do their job and then go home; it is quicker to send an email and wait until next day for a clearer answer, rather than talking, which can take longer time*".

Stage 3: Acknowledging team members' contributions was considered by all respondents as important in building trust within the team. "*Recognition in a team sense is usually much more effective, so when we have these broader events in the project, we like to acknowledge people, we recognize them*" said Respondent D. Other forms of acknowledgement mentioned were direct communication to the management about members' excellent behaviour, written nominations for the groups by the CEO, positive and soft direct feedback. Respondent B exemplified that "*even for a small thing, a thank you note was sent and usually you send a thank you note copy to the stakeholders and line managers, so people got a lot of thank you all the time*".

The way communication was flowing among team members was one factor that respondents acknowledged to be more difficult to monitor. However, all the respondents mentioned that they tried to be the glue within the team, so that the team members felt free and comfortable to raise any issue. Respondent B specified:

"I try to create an environment where people really dare to be open, but it is very challenging. You also experience moments when people in the team don´t work well together and both could be key experts, so you need to find ways around how they could work together without conflicts. You are kind of the glue in between".

Moreover, Respondent D evidenced the use of the sampling method of how effective communication was flowing in the operational layer. Exemplifying, the project manager said: "*I can talk to the team in China for instance, and I can talk to the team in Europe and you can just compare understanding and alignment; it's constant sampling*".
The philosophy mentioned by Respondent B and D as being central was: "*you bring issues to meetings and not meetings to issues*". Respondent D specified that the weekly reviews for instance did not have anything to do with objective issues, but more with the mindset and the feeling of the team: "*the project managers will start with expressions like "I feel…" or "I think"; in a very mechanical-engineering based company like ours, to get people to open up about their feelings, is quite something*".

Additionally, the PMs encouraged participation manifested by the team members, in order to create a dynamic team and foster trust. As Respondent A put it: "*when it comes to deliver, you should stick to your part that is agreed, but when it comes to ideas and evolving the project, I expect everyone to contribute even if it is outside their area".*

Finally, the respondents mentioned they were limited in their informal communication with the team members, the non-task related communication missing during the virtual work. Most of the informal communication happened during the occasional face-to-face meetings.

Stage 4: Availability was one of key elements emphasized by the respondents as important in building trust. Respondent A pointed out: "*you need to have "hand-holding meetings" because someone might need an extra push to be able to start".*

Also, most of the project leaders mentioned that it was important to be explicit and very present, since especially the remote people do not always see what the leaders do in the background, so it was not always appreciated that they, as leaders were busy. As Respondent G put it: "*there are still some parts of the organization that do not understand how overhead we are in working with virtual teams - the*

workload is underestimated". Moreover, support was seen as something to be offered individually to every member depending on their background and personality. Respondent F mentioned: "*you get to learn the people, so you know who needs more support than others; you have to look at each person individually*".

Ensuring that members were clear and informed about everything concerning the task, was accomplished by the project leaders by asking questions, organizing monthly meetings, short interview controls, workshops, health check questionnaires and weekly status reviews.

Stage 5: Half of the respondents celebrated interim deadlines. The celebration occurred during meetings as a result of an overview of the major obstacles and achievements. Respondent B instanced: "*when we had an update meeting, I brought the project star, so when someone really reached a milestone, they received it; all got one star*". Additionally, Respondent G said that interim deadlines were very important since a project might be very long and people that might have contributed in the beginning might have not contributed in the end and they may feel that their efforts were not appreciated. The other project managers that did not celebrate interim deadlines said that they celebrated the accomplishment of the final deadline.

Also, all the project managers admitted to have encountered often delays concerning the delivery of the final project outcome. These delays were usually accepted and welcomed for the safe of quality and as a result of daily adjustment of schedules, priorities, deliveries. Respondent C mentioned: "*if we should put all the members in the same room, we would deliver in a shorter time, so the virtual environment results in delays on the total delivery*". However, the other respondents based the delays on the discovery of unknown factors concerning the product or technology, or the need to perform more cycles to get the right final product.

4.3.1 Face-to-face meetings

All of our respondents met face-to-face with their team members at least once. The respondents addressed both the frequency of the face-to-face meetings but also their importance in the progress of virtual projects.
According to Respondent G, having face-to-face meetings in the beginning was the best practice:

"Start with a physical meeting and close with a physical meeting, and also try to meet two or three times per year. It is more intense in the beginning because you need to find your plan and your schedule, so initially it is more frequent and then during the delivering phase it is more to follow up" (Respondent C).

During the progress of the projects, all the project leaders met at least every six months and looked in everyone's calendars, made commitments, discussed what was realistic to deliver in the next phase. In addition, Respondent D mentioned that in all projects and programs they always had a period of collocation, where they brought the team to formative events, so that the members had at least a personal acquaintance: *"it doesn´t really work well if you never had the teams at least shake hands"* (Respondent D).

The importance of the face-to-face meetings was addressed by the project leaders by mentioning their relevance in creating team spirit, in offering the possibility to communicate the expectations and also the possibility to see team members' reactions.

Analysis

Stage 1: Greenberg et al., (2007) mention that the way leaders could go in fostering trust in the first stage is through choosing the right people, offering training and creating a competitive reward structure. This stage refers to actions that project managers could take before the first interaction of team members. However, practically, as a result of our research, we found out that project leaders do not participate in the process of selecting the team members and that the selection is mainly based on technical skills and availability, with no emphasis on previous international experience or virtual work experience. The same applies to the reward structure; the project leaders are not aware of the monetary incentives the team members receive, thus, not being able to create the foundation for trust-building through designing the reward structure they would consider adequate for encouraging cooperative behaviour that would have a positive influence on trust.

Stage 2: In our theoretical framework, the importance of **initial trust** is emphasized due to the fact that generally the members have no past or future to reference to as the foundation of trust. Our respondents admitted the difficulties in creating trust at the beginning and referred to creating a **common purpose** for the team as the first step in achieving trust, in addition to promoting a culture based on respect towards everyone's skills and previous experience. According to Greenberg et al., (2007) at this stage, team leaders can reinforce trust by introducing team members' main achievements, initiating team building activities to create cohesion and establishing communication rules. The respondents mentioned that introducing team members' previous achievements was not always or at all done because it depended on the cultural background of the members, if they saw it as important or not. Team building activities were highly encouraged by the project leaders during the face-to-face meetings but even if Greenberg et al., (2007) encourage virtual activities, these were lacking in the case of our respondents' experience. In addition, there were barely any formal rules of engagement within the teams, or if there were, they were not followed properly. Hence, at this stage trust building starts with emphasis on task and technical expertise and relies on the functional roles of the team members.

Therefore, within our research, compared to what was stated in the theory, we noticed that project managers start building trust at the inception stage of a project because their role as a project manager does not allow them to initiate trust building at the planning stage for the reasons explained in the first stage.

Stage 3: According to the theory supporting this stage, frequent communication, non-task related communication, monitoring of communication patterns and encouraging of participation are essential parts for trust-building within teams (Greenberg et al., 2007). What we identified as a result of the interviews was that respondents found it difficult to monitor how communication was flowing among team members. Instead of doing so, they ensured to be the link within the team by encouraging sharing of experiences, being open so that to create a culture where the

issues were brought to the meetings and not the other way around. Also, participation was highly encouraged and seen as important to create a dynamic and trustworthy team. However, non-task related communication was lacking or limited to the face-to-face meetings, even though theory emphasizes its crucial role at this stage. Therefore, trust is **cognitive** and continues to be based on technical expertise, integrity and functional roles.

Stage 4: Theory says that trust should change at this stage from cognitive to **affective** (Greenberg et al., 2007). In order to do so, leaders need to show their availability, to acknowledge the team's performance and to provide guidance to complete the task. Availability was emphasized as vital by respondents as well, and was ensured by giving support to the team members in times of difficulties, by being prompt in their answers to the team members, and by being present and explicit in their communication. The need for guidance was assessed by the leaders as a result of the monthly meetings, interview controls, workshops, health check questionnaires and weekly status reviews. Also, acknowledging the team performance was accomplished through direct communication to the management, written nominations by the CEO or other ways of positive feedback.

One aspect not covered by theory but recognized as dominant in building trust at this stage was the effort leaders put into learning more about each individual's personality and background so to build up a personal roadmap to understand how every member reacted, behaved and what kind of support he or she needed.

Stage 5: As Greenberg et al., (2007) assert, at this stage, the outcome based on group performance plays a crucial role. Therefore, delays and missed deadlines communicate the low priority of the team task. However, our respondents had a different view on how delays affected team trust. Meeting the deadline was perceived as a secondary factor in the cases it was done for the safe of quality or because new 'surprises' appeared along the way and there was the need of certain adjustments. Also, the virtual character of projects was challenging in terms of coordination which meant that modifications in the deadlines should not be seen as a barrier to trust. More emphasis was put by the project leaders on the celebration of interim deadlines which was considered more important than the final deadline. This practice is supported by Greenberg et al., (2007) who claim that celebration of interim deadlines helps to build strong social bonds needed for the positive assessment of members' benevolence, aspect deemed as vital at this stage.

In conclusion, achieving trust was perceived by team members to take time, and having the ability to learn how to handle diversity and empowerment. Also, as theory emphasized the importance of initial swift trust, Respondent E supported the statement by saying: "*maybe the first two meetings should only be about getting to know each other, getting to know your motivations, getting to know who you actually have in the team*".

Face-to-face meetings

In the literature we address the importance of having face-to-face meetings in the beginning of the virtual team's life cycle as one way for virtual teams to achieve high levels of trust (Brahm & Kunze, 2012). The project leaders emphasized the importance of initial face-to-face meetings in

order to be able to get to know the team members, to get to know their motivations and build a first important impression of the team. Also, with our findings we support the claim that repeated face-to-face meetings are best when occurring at predictable times and intervals (Mortensen & O'Leary, 2012). In our case, these meetings represented an essential component in order to follow up on how the project was running, make a strategic plan for the next meetings, assess if any changes concerning the project variables had to be made; and they all occurred at least 2 times per year. Moreover, face-to-face meetings contributed to build trust and cohesion within the teams, since during those occasions the teams organized informal activities, team-building exercises and recognized the need of different members for support.

Finally, independent of the degree of virtuality of the team led by the project leaders, all the respondents could not think of a successful virtual team without having met at least once face-to-face during the project life. Therefore, we can draw the conclusion that the effectiveness of virtual projects is still highly dependent on the face-to-face interactions.

4.4 Leadership behaviour

Empirical findings

All the respondents in our study mentioned that in leading virtually it was challenging to have the members' time dedicated to their project. Theoretically, the managers should have a certain percent of a person's time (Respondent F) which means that team members are not always dedicated to the project; they always struggle between different priorities (Respondent E). This aspect influenced project managers' leadership behaviour since they had to compete for their team members' time.
In our interviews with the Project Managers, we identified three clear patterns that influenced leaders' behaviour when working in virtual projects. All the respondents referred to the relevance of the management of expectations, change management and motivation and empowerment on effectively leading a virtual team. All these passed through the filter of cultural awareness and a clear definition of project success. Therefore, these patterns will be discussed further by linking them to task and relationship-oriented behaviour.

4.4.1 Task- and relationship-oriented behaviour

The project leaders mentioned that for virtual projects it is important to balance the task and relation-oriented behaviours. Balance however did not mean equal of both. As one of the project leaders explained, you first set the objective and then start managing people according to the objective: *if the common objective is not clear, we are efficient but not effective, we run really fast but in the wrong direction*" (Respondent G). Also, focusing on task should not outweigh the people orientation behaviour. Responded E claimed:

"*If you focus on tasks, you will get people behaving as tasks – they do exactly what you ask them to do and then they stop, which in a way you don't want, you want them to think further than what you give them as a task*".

This balance was perceived as not depending on the virtual setting or on distance, but mainly on the people in the team and on the company culture. Therefore, Respondent B and Respondent C emphasized communication and creating the right climate where people dared to speak up and ask questions:

"*Focus on people, on how they communicate; so if I hear someone flagging for a potential issue then I know, well this person used to say well before an issue appeared or this person will not tell me before it is an issue*" (Respondent C).

As part of the task-oriented behaviour the project managers had to define the extent to which they applied pressure in order to obtain results (production emphasis). Therefore, pressure was applied by all project managers in different instances. However, one of the respondents (G) made a difference between pressure and stress. He/she mentioned that stress was a level of pressure that was blocking, while pressure was a way of unlocking. Also, it was important to share pressure as part of motivating people: "*if the responsibility is on one team member only, we have done something wrong*". Moreover, pressure was applied differently depending on the individual's personality and way of functioning, and only in the cases that the deadlines were not negotiable or changeable. Additionally, pressure could increase depending on who, in turn, was pushing the project manager. As Respondent E exemplified: "*In the end I have to deliver something that is demanded by the higher management level and the only thing I can do is to push it further and make it happen*".

Management of expectations

The management of expectations represented one of the main leadership actions that project managers spotted as being central to leading virtually. Respondent D mentioned that one of the main barriers in leading virtual teams was the management of expectations, its importance being emphasized by time difference, distance and culture. Especially in the virtual setting, when you do not see someone every day, you need clarity and you are forced to be more explicit (Respondent D). Respondent E added by saying that people understand what their responsibility is but do not always understand what is expected from them. The management of expectations is important because "*if the team members work 3 days in the assumption that they know [what's expected from them], and on the 4th day they understand they were on the wrong track, it can demotivate people to do it again*" (Respondent E).

Change management

Another common pattern identified among the project managers as vital for leadership behaviour in virtual teams was change management. A project represents a way to capture change, manage change and implement it: "*if I compare what the project deliverables are with the intention we had at the beginning, most of the time is a night and day picture of the same landscape*" (Respondent G).

Additionally, Respondent D mentioned that one of the great challenges for remote teams is called "scope creep" – "*how something changes over time in terms of what it is the members should deliver; if you don't keep that constant cross-check, you focus on the output and you don't realize that the change is happening*".

Respondent C added that change management was vital because if you managed to perceive change, it helped planning and explaining in advance the reasons of certain missed deadlines: "*if you say it in advance, it is very well accepted – it could be seen as a success*".

Motivation and Empowerment

Motivation and empowerment surfaced in our interviews as a result of assessing leader's orientation towards people and their tolerance of freedom, of allowing team members to take initiatives and action. In this sense, Respondent G mentioned that in order for a project to run smoothly and effectively, a leader should motivate people: "*when you have motivated people in the right way, they can run not only an extra mile, they can run extra thousands of miles*". Respondent E also emphasized motivation as essential in a remote setting:

"*You depend more on your motivational skills – you should make people do something for the right reason, not because I ask them or push them, but because they feel with the goals and they accept the challenge. In a remote sense, it is about developing implicit motivation rather than explicitly pushing the team*".

Giving freedom to the members was an aspect mentioned by all the respondents. However, they also mentioned that there had to be a limit: "*I give a lot of freedom in terms of directions, priorities, but in some cases I have seen it was too much, and then you have to grab the rope and pull it back again*" (Respondent E). The same idea was mentioned by Respondent A: "*you need to make sure everyone gets to say what they want to and that everyone is heard, but when you need to put the foot down, you have to be able to do that*".

Respondent C on the other hand asserted that he/she had to give empowerment to the members because the team had to trust him/her as he/she had to trust the team. Also, when you want a lot out of people, you really have to find first what motivates people (Respondent B).

Even if in our research study we do not focus specifically on the feeling of isolation of team members in a virtual environment, we noticed that this element was brought up by two project leaders as a factor they had to pay attention to as part of motivating the team.

4.4.2 Shared leadership

Leadership was shared by all the respondents to a certain extent. They all agreed that they had subgroups where other people had leadership responsibilities. However, the overall leadership was still detained by the project manager. Respondent A argued that the people who took the leadership of some subparts had to have the same awareness that he/she had. Also, Respondent B mentioned that since everyone had their work they were responsible for, everyone was a leader in a sense, but he/she never let go fully of his/her role as a leader. Respondent F emphasized the importance of having shared responsibilities because it helped him/her not to fall down to all the details. Moreover, Respondent G explained why it was important to share leadership:

"*We try to split as much as possible and implement as many leadership and authority levels as possible because it is easier to* ***solve problems*** *but also to* ***recognize problems*** *when you have the right level of escalation*".

However, the project managers did not think that shared leadership was somehow different in a remote setting than in a traditional one. Moreover, shared leadership was supported to a larger extent only if there were people within the team that had good leadership skills.

Analysis

In our theoretical framework, researchers claimed that in a virtual context the importance of task-related leadership increases (Bell and Kozlowski, 2002; Davis, 2004, Griffith & Meader, 2004, as cited in Zimmermann, Wit and Gill, 2008). As a result of our research, the theoretical statement made was confirmed by our respondents. However, even though task-related behaviour increases, it should not outweigh the people-oriented leadership behaviour. Also, the contingency theory explains that the leader's behaviour depends on situational factors such as task and organizational conditions. However, in our study we identified that leaders' behaviour in most instances depends on the people in the team, on their background and experiences rather than the nature of the task.

Moreover, Hart and McLeod (2003) found out as a result of their field study that socio-emotional relationships or a people oriented leadership behaviour in virtual teams are built through intense and frequent task-related messages, rather than messages with "personal contents". We come to reinforce the conclusion of this study by outlining that frequent and intense communication, even though task-related, might be a way of contributing to the creation of cohesion within teams rather than personal or informal communication. However, according to Bass (1990), relations-oriented behaviour ensures a high level of trust within teams and a more certain way towards project success. In this sense, as part of their relationship-oriented behaviour, our respondents emphasized the importance of creating a climate where people were motivated to act, step in, be open and share ideas and thoughts. According to them, empowerment was the most suitable way to ensure effective leadership in virtual teams.

Derived from our empirical findings and with the aim of emphasizing the task and relationship-oriented leadership behaviour, we built up the following table that allows for an alternative understanding of the balance concerning task and relations-oriented behaviours.

Table 4.1 The Leadership Dimensions according to Stogdill applied to our study (Holloway, 2012, p. 12)

Task-oriented behaviours	Relations-oriented behaviours
Production emphasis – the respondents applied pressure when necessary and according to every individual's perception, personality and behaviour, so the pressure would not become a way of blocking (stress), but a way of unlocking.	*Tolerance of freedom* – great room for initiative and action. **Motivation and empowerment** – another component of the three critical leadership behaviours for project success. However, difficult to achieve because often, members were not interested or even afraid to step out of their role.
Initiation of structure – **management of expectations** mentioned as one of the three central leadership behaviours. Its complexity is fed by time difference, distance and culture,	*Tolerance of uncertainty* – we refer to **change management** as another essential component of the three ones mentioned by project leaders. Leaders were able to tolerate postponements

forcing a greater need for clarity and explicitness.	without anxiety which outlines their orientation towards maintaining good relationships with the members. Also, they emphasized the need to have a keen eye for the changes along the way and make the right adjustments.
Role assumption – shared leadership was beneficial for coordination of tasks but was limited and did not apply to decision-making.	*Demand reconciliation* and *Integration* were tackled successfully by being culturally aware of differences and by acting as intermediaries in case of conflicts.
Persuasion and *Superior orientation* identified as trivial.	*Predictive accuracy* – one of the reasons that delays were permitted, since in innovation projects, long-term accuracy was difficult to achieve.

From the above table we can observe how leadership behaviour was manifested within our research. Even if theory identified that task-oriented behaviour was more appropriate for achieving successful results, our leader's task oriented behaviour is more vivid at the beginning of the project, by setting a clear and challenging goal for the team and if the tasks were accomplished according to the set milestones, the whole attention was oriented towards building relationships and foster communication that facilitated the smoothness of the project.

According to theory, shared leadership is thought to be particularly relevant for virtual teams, since team members are separated from the team leader and from each other, which leads to a need of a distribution of leadership functions (Shuffler, Wiese, Salas, & Burke, 2010). Our research confirms the importance of shared leadership in virtual teams as a facilitator for a better recognition and resolution of problems. Moreover, we would like to underline our two main conclusions concerning shared leadership in virtual project teams:

1. From the theories presented in the theoretical framework, we support with our findings the conclusion made by Hoch and Kozlowski (2012) in their study which claims that team members do not necessarily need to have the same leadership behaviour as their manager; rather shared leadership should be seen as the extent to which team members behave in ways as to stimulate the team processes which determine team performance. To further the conclusion of this study, we mention that shared leadership occurs in teams where members have good leadership skills and is accepted as a way to give members the possibility to experience the leadership role and feel empowered. However, team members' leadership roles are not equal to the project leader leadership role.
2. Even though theory states that shared leadership is more effective when tasks are independent and complex (Pearce, 2004), it does not apply to decision making, the overall leadership in this area being retained by the project leader.

4.5 Project team members' perspective

In order to present team members' perspective, we integrate together both the survey results and the corresponding analysis and discussion in correlation to theory and project leaders' assertions.

4.5.1 Background

The 32 respondents in our survey were based in 11 different countries or regions as presented in Table 4.2, which outlines the global dispersion across countries and continents of the team members. This also confirms that the virtual teams the members were involved in are geographically, organizationally, temporally and culturally dispersed.

Table 4.2 Location of Respondents

Country/Region	Percent
Sweden	28.1%
France	18.8%
Europe	15.6%
United States	12.5%
United Kingdom	6.3%
Chile	3.1%
Brazil	3.1%
Germany	3.1%
Colombia	3.1%
Asia/Pacific Region	3.1%
Peru	3.1%

Table 4.3 The Functional Role within the Team

Functional role	Percent
Project management	43.8%
R&D	43.8%
IT	25.0%
Information and research	12.5%
Finance	9.4%
Strategy and business development	6.3%
Risk	3.1%
Operations and production	3.1%
Marketing and sales	3.1%
Human resources	3.1%
Legal	3.1%
Procurement	3.1%
other	15.6%

In addition, concerning the amount of time respondents dedicated to working in virtual projects (Figure 4.1), 28.1% of the respondents indicated 60-80 percent of their time, followed by 25% of the respondents indicating at least 80 percent of their time, and only 18.8% of the team members reported virtual projects as the only way they worked. The other 28.1% of the respondents worked less than 40 per cent in virtual projects, the rest of the time being dedicated to traditional ones. This aspect is an important factor in our research, because it emphasizes the fact that team members were involved in both face-to-face and virtual projects, which leads to a better understanding of the challenges of working in a virtual setting. Moreover, that confirms leaders' assertions that they had to compete for their team members' time and dedication and therefore, their leadership behaviour was influenced by this aspect.

Referring to Table 4.3, 43.8% of the respondents indicated R&D as their functional role within the team, equally 43.8% had project management roles within the team and 25% of the team members detained an IT function. This underlines the fact that the majority of projects in our research study are innovation-oriented.

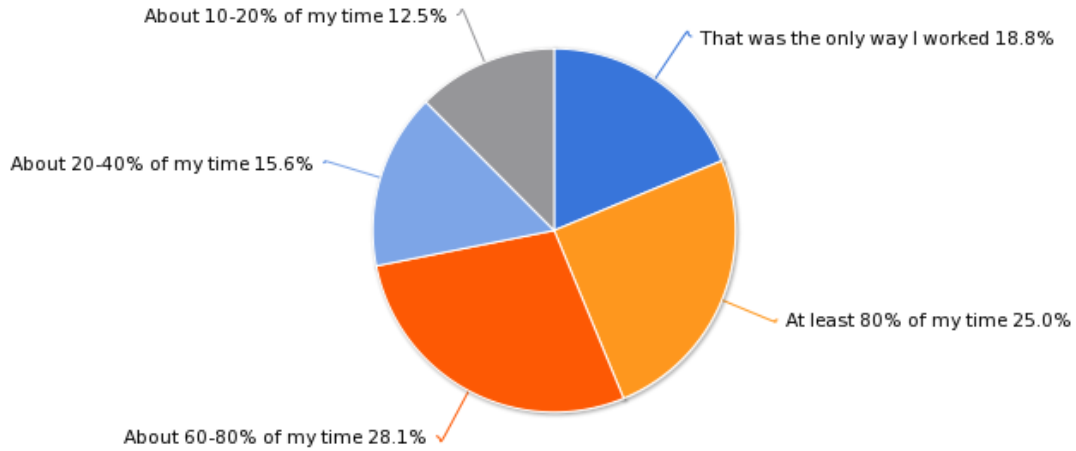


Figure 4.1 The Amount of Time Respondents Spent Working Virtually.

4.5.2 The challenges of virtual teams

According to the team members, the most challenging factor for virtual teams was time zones (50%). After time zone, it was quite equally divided between trust-building (43.8%) and coordination of tasks (40.6%). Slightly less challenging were the computer-mediated communication (34.4%) and cultural differences (34.4%). The factor considered the least challenging was language (25%). This comes in contrast with project leaders' assertions that differences in language proficiency did affect project effectiveness and created great barriers to communication.

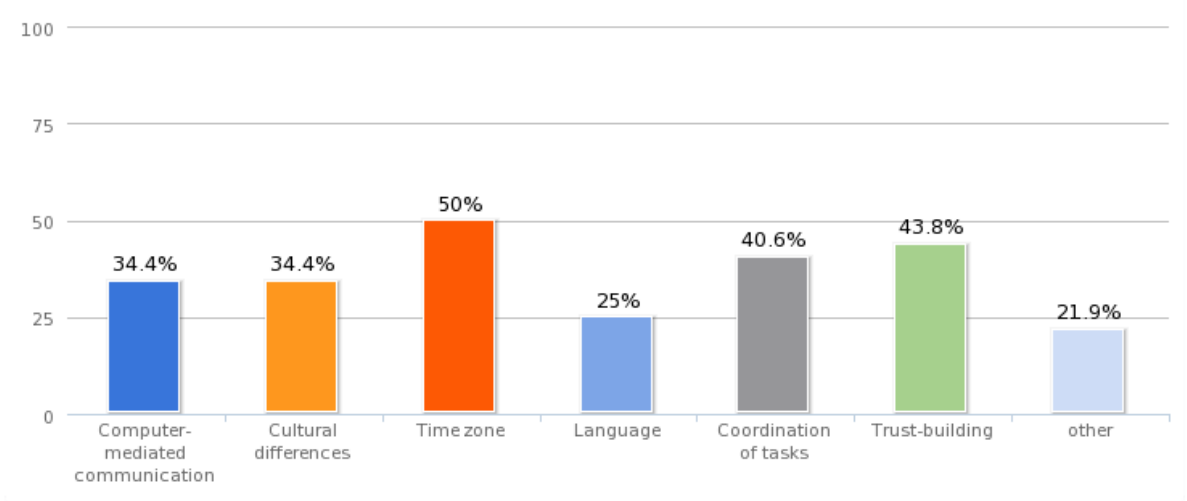


Figure 4.2 The Most Challenging Factors for Virtual Teams.

In the frame of reference, Martinelli et al., (2010) assert that for global teams, it is much more challenging to build chemistry and create bonds between members because of different time zones, computer-mediated communication and cultural diversity. However, concerning the

differences in time zones, the leaders mentioned to have always succeeded to overcome the difficulties, by being always available and sometimes even sacrificing their personal time. Surprisingly, team members still consider the differences in time zone to be the biggest challenge for their virtual team.
When asking the team members to add any other comment to this particular question, they added as challenges the following factors: "*leadership by remote*", "*follow-up and completion of tasks*" and *"working with cultural differences and strange atmosphere at the beginning of the project"*. These comments emphasize project leaders' claims that it is hard to monitor team members, to know what the people on the "other side" are doing and what they prioritize. Therefore, as the project leaders acknowledged, it is essential to have repeated face-to-face meetings during the projects to follow up on the progress made. Also, having face-to-face meetings at the beginning of the project facilitates trust-building and helps to dissipate the strange atmosphere that might be when forming the teams.

Another comment made by a team member addressed the challenge of "*creativeness in virtual meetings"*. This challenge confirms what was previously addressed in the empirical findings: "*everything within a virtual team needs to be arranged [...] which in a way hinders the input of creativity because not every bright idea comes at the moment you are having a meeting*" (Respondent E).

Additionally, another team member responded with the following statement:

"The team members had very different backgrounds, experience and personalities, e.g. some were entrepreneurs while others were extremely focused on details (this was both a source of irritation and strength). Several members worked full time on other projects".

This relates to Fisher and Fisher's (2011) claim that besides nationality differences, there are differences in education, background and personal life experiences that might lead to cultural misunderstandings and undermine effective work. Therefore, as Respondent G put it, only by acknowledging that there is a cultural difference within the team, you can make the best use of it. Moreover, the above statement points out to Kezner's (2009) affirmation that cultural diversity should be used in a positive way, therefore project leaders should focus on making the team members' background differences a source of advantage and strength rather than a source of irritation and conflict.

Further on in the questionnaire, 56.2% of the team members agreed or strongly agreed with having experienced misunderstandings or conflicts during the project, 28.2% disagreed or strongly disagreed and 15.6% were neutral. These findings tell us that that the majority of the team members recognized some kind of misunderstanding or conflict in their virtual team. This also confirms what has been previously mentioned by the project leaders that conflicts were something quite common, but that they were mainly task-related.

Concerning the most efficient tools used to communicate and collaborate within the virtual team, team members' opinions did not differ from their leaders' considerations. Therefore, 87.5% thought it was the Email, 81.3% - Web conferencing and 62.5%, fixed phones. However, derived

from project leaders' statements these old communication tools were used because it was considered convenient by the project leaders and did not require much initial effort in utilizing them (Jansson, 2005).

4.5.3 Project success and leadership behaviour

Team members' perspective concerning the factors influencing project success is aligned with leaders' perspective in that clear objectives, roles and responsibilities is one of the most vital elements for ensuring successful projects. Besides clear objectives, roles and responsibilities for which 96.9% of the respondents agreed upon, the other two factors deemed important to contribute to project success were the project spirit such as trust, good communication and leader's ability to empower (78.1%) and stakeholder and customer satisfaction, with a much lower percentage of 31.3%. Surprisingly, even though seen as challenges for working virtually, cultural understanding and adjustment (25%) and the successful integration of information technology tools for communication (18.8%) were not perceived by the team members as having a great contribution to project success, unlike their project leaders.

Referring to Question 6 in Appendix 2, 75% of the respondents described their leader as focusing on accomplishing the task, 71.9% as motivating and empowering and 68.8% saw their project leader as focusing on people and creating relations among team members. This way of leading was considered by the team members as suitable and efficient for leading virtually, with strongly agreeing (59.4%) or agreeing (31.3%) with it. The balance of task and relations-oriented behaviour is aligned with how leaders described their way of leading, with a task-oriented behaviour more explicit at the beginning of the project, by setting a clear and challenging goal for the team and switching orientation afterwards towards building relationships and fostering communication.
Moreover, Zimmermann et al., (2008) concluded in their study that most task-oriented leadership behaviours become more important as the degree of virtuality in the team members' daily work increases. Figure 4.3 shows the correlation between the task-oriented behaviour of leaders as perceived by team members and the degree of virtuality of members' daily work activities. What we could notice is that the members less involved in virtual activities (40% or less) indicated their leader being equally focusing on task and relations. At the same time, while the degree of virtuality of activities increases, also the task-oriented behaviour of leaders becomes more important, therefore confirming Zimmermann et al.'s (2008) study results.

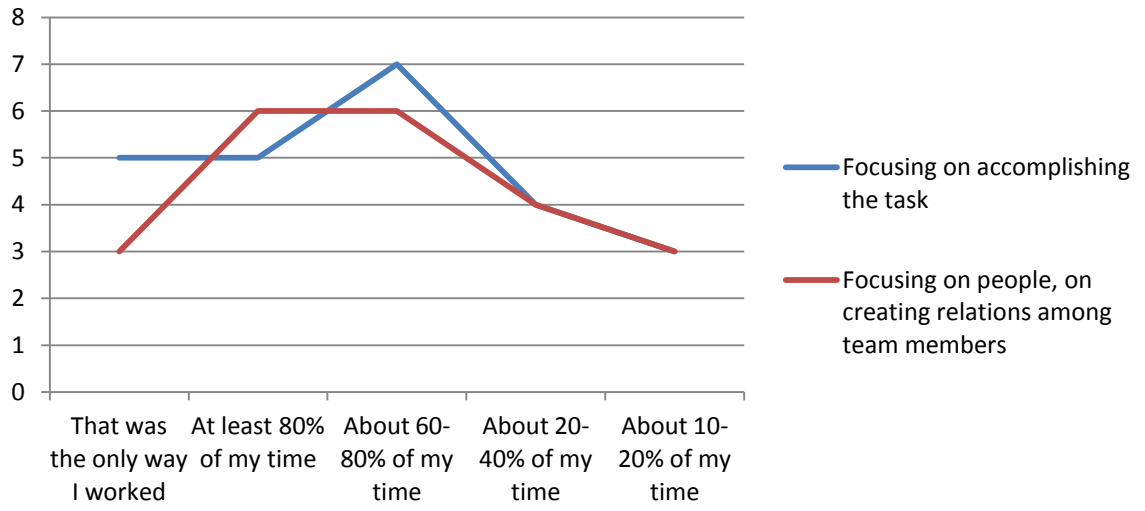


Figure 4.3 Correlation between the Amount of Time Members Work Virtually and Their Perception of Leader's Behaviour.

4.5.4 Trust-building

Greenberg et al., (2007) assert that in the first stage of the development of the teams, cognitive trust plays a major role since members tend to rely on each other's competences and performance integrity. The team members in our study strongly agreed (71.9%) or agreed (25%) with trusting their team colleagues' knowledge and expertise. Even though this type of trust is important at the beginning, it is not enough to ensure that trust will develop. Therefore, going to later stages in the project team's life, the members did not feel to the same extent that they could rely on their team colleagues' help or support: 53.1% strongly agreed, 28.1% agreed, 9.4% disagreed and 3.1% strongly disagreed that they could rely on the other team members for help or support. This slight disparity between trusting the knowledge and expertise of the team members and trusting to rely on the other team members for support might represent a problem of lack of social bonds within the team (Greenberg et al., 2007). Moreover, as leaders pointed out to the great uncertainty that characterizes projects, social communication should be taken more into account. As project leader D mentioned:

"*Our projects are born out of the uncertainty that exists, risk for example. We take on our portfolio things that have never been done before, so there is a belief that they cannot be done again or will not be done. So it's a blend of certainty and inspiration: that's our focus.*"

Furthermore, leaders mentioned that at the initial stage of the establishment of the teams, they did not follow a very organized or detailed introduction of the team members to each other due to the fact that some of the members knew each other from previous projects, or due to cultural aspects. In answering the question of how well they felt they knew the other team members, 34.4% of the respondents strongly agreed and 40.6% just agreed. While this information confirms leaders' attempt to be the 'glue' among team members and facilitate the process of getting to know each other, 21.9% were still neutral and 3.1% disagreed with the statement. The

results indicate that there is a need for improvement for trust-building in the stage of team establishment.

As covered earlier, non-task communication is an important element of building trust in stage three of a team's life. Interestingly enough, when asked if they often exchanged information on topics other than work (eg, personal interests), 43.8% of the respondents were neutral, 9.4% disagreed and 3.1% strongly disagreed (Figure 4.4). Therefore, just 34.4% of the respondents acknowledged having exchanged non-task related information. However, this result is aligned with leaders' assertions that it is challenging to have informal communications due to time constraints, the unwillingness of members to make an effort due to the temporary aspect of the projects or just because virtuality makes it more difficult. These aspects, if not addressed might pose difficulties to building trust and ultimately may have a marked impact on performance.

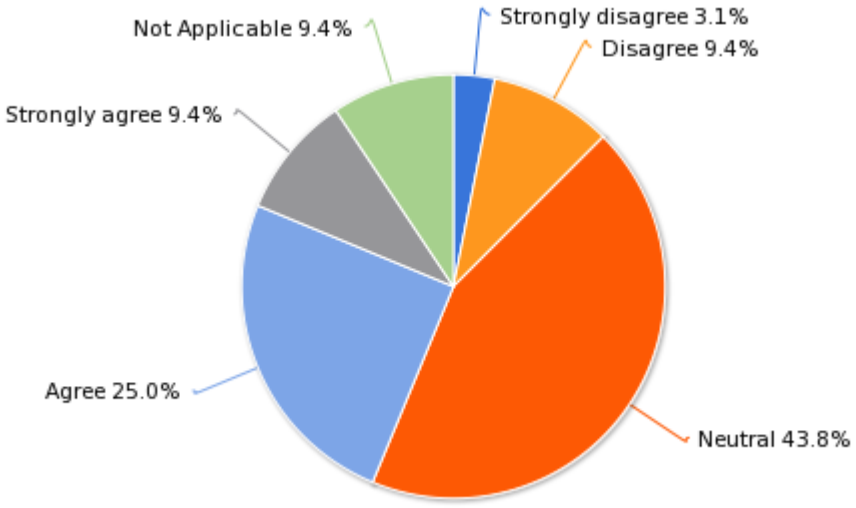


Figure 4.4 Exchanging Non-task Related Information (eg, personal interests).

All the respondents were positive about having clear roles and responsibilities assigned within the team (Question 9, Appendix 2, M: 4.4 SD: 0.9) they upheld the statement that the leader replied promptly to their questions and inquiries (Question 10, Appendix 2, M: 4.5; SD: 0.8) and that their achievements were acknowledged individually and within the team (Question 13, Appendix 2, M: 4.4; SD: 0.9). These findings go in line with leader's claims concerning clarity of roles and tasks as main determinant of project success, with their emphasis on being available and acknowledging publicly the efforts and achievements of team members. These factors are according to Greenberg et al., (2007) essential for nurturing trust and reduce the complexity of managing virtual teams.

Concerning the implementation of communication guidelines which are effective for reducing uncertainty and increase trust (Greenberg et al., 2007), the project leaders were not relying on formal communication guidelines: "*no formal guidelines, we get very used to it – everyone is used to having these meetings and it is getting better and better*" (Respondent F). Or Respondent G claimed that "*there is no rule when and how we should communicate; there is always a rule that we have to communicate*". Only two

project leaders mentioned having implemented rules of communication. However, 40.6% of the respondents in our survey strongly agreed and agreed (43.8%) with the statement that their project leader did implement communication guidelines within the team (Figure 4.5). Moreover, 12.5% were neutral and just 3.1% disagreed. These contradictory views may be due to team members' perception of communication guidelines, considering both formal and informal guidelines when answering the question.

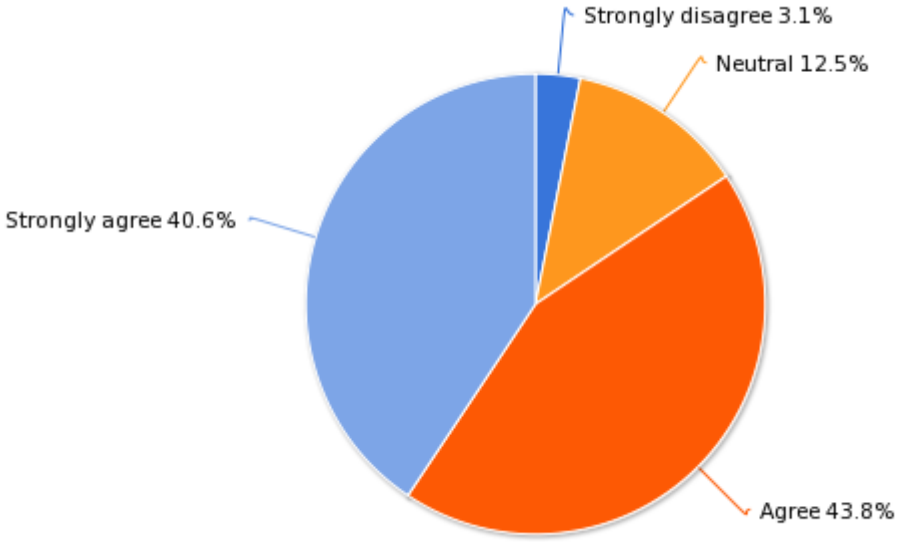


Figure 4.5 The Implementation of Communication Guidelines by Project Leaders.

CHAPTER 5

Conclusions, contributions, and implications

This chapter contains the overall conclusions, theoretical contributions, practical implications and suggestions for future research.

The main purpose of this thesis was to explore the leadership of project managers in a virtual working environment, focusing on how the challenges specific to a virtual context affect virtual leadership, how trust is built within virtual teams and how leadership behaviour is manifested in a virtual setting. Next, we present the main conclusions of our study by answering each research question accordingly.

5.1 Conclusions

RQ1: How do the challenges specific to a virtual working setting affect virtual leadership perceived effectiveness and perceived project success?

In their definition of project success and effectiveness, project leaders referred to the importance of both end-measurables (time, budget, quality) and intra-measurables (ability to empower, to see change, and manage expectations). The challenges specific to the virtual environment such as communication through technology, cultural differences, managing conflicts, and building trust affect both the way end-measurables are achieved and the way the project intangibles or intra-measurables are handled. These challenges considered in our study were perceived by the project managers as the most critical to control in order to achieve project effectiveness. Therefore, our findings reveal the communication challenge as being time and energy-consuming, leading to delays for the project deliverables. Moreover, communicating through computer-mediated technology represents a great hindrance to creativity within virtual meetings, especially because of lack of coincidental meetings and additionally, demands for flexibility and availability for the project managers. Also, the use of technology with a low synchronicity and social presence such as the Email and fixed or mobile phones, and misalignment of technology within organizations render communication more difficult to achieve and affects trust building and effectiveness. Undermining communication technology trainings by the organizations in our study at the beginning of projects and along with the development of technology represents an essential drawback to effective communication and results delivery.

On the other continuum, team members perceived the difference in time-zone as the most challenging factor that posed difficulties in following up the completion of tasks. Also, as emphasized by the team members, working in projects increases the complexity of coordination of tasks, since some of the team members worked full time on other projects. We consider this aspect as an essential finding within our research to which leaders referred to as well, and that affects how they shape their behaviour and the extent to which they can influence certain variables when leading virtually.

Cultural differences on the other hand, affect how team members perceive the achievement of project goals and tasks, and therefore, ask for more explicitness, for great focus on managing expectations, and for being open-minded to build cultural knowledge mainly through experience. However, from team members' perspective, differences in background and experiences represent a challenge that project managers should take into consideration, to transform differences from being a source of irritation to being a strength for the team.

Furthermore, our findings show that conflicts, if task-related, have a beneficial impact on team dynamics, since they may be a way of surfacing team members' feelings, frustrations and the challenges related to them make team members become stronger and more united.

RQ2: How is trust accomplished in a virtual setting, given the temporary aspect of projects?

Having tested Greenberg et al.'s (2007) model of how project leaders build trust in different stages of a project team's life, the results show that project leaders start creating the foundation for trust in the inception stage of a team and reaches the apogee in the transition stage. Initially, trust was achieved through creating a unifying purpose to which everyone could adhere and through which members could rely upon each other to attain it. Moreover, as importantly emphasized was to create a culture based on respect towards everyone's skills and previous experience. This culture could be shaped through regular face-to-face meetings, team building activities, playing the role of the 'glue' among team members, by encouraging sharing of experiences, being open and bring the issues to the meetings and not the other way around. Other appropriate activities that fostered trust within project teams at later stages of the project life were to encourage supportive communication, celebration of interim deadlines, recognition of achievements during face-to-face meetings, being present when need for guidance and giving feedback as a result of different assessment tools, such as monthly meetings, interview controls, workshops, health check questionnaires and weekly status reviews.
However, the findings also revealed the drawbacks of Greenberg et al.'s (2007) model when applied to virtual project management. Some of the step actions managers were encouraged to follow did not take into account the temporary nature of projects, the length of some projects limiting project managers' influence on building trust at every stage of the team's life. Therefore, project managers did not focus on virtual team building activities and did not exchange information other than work with their team members when being physically dispersed, fact confirmed by the team members as well. Subsequently, our survey results exposed a lack of social bonds within the team as a result of the disparity between team members' trust towards each others' knowledge and expertise and the trust to rely on the other team members for help and support.
In addition, Greenberg et al.'s, (2007) model does not capture the nature of projects, the project leaders not being able, for instance, to participate in the selection process of the members or to influence their team members' behaviour through an adequate reward structure, since these did not fall into their area of responsibilities.

Additionally, one aspect not covered by theory but which we recognized as dominant in building trust was the effort leaders put into learning more about each individual's personality and background so to form a personal roadmap to understand how every member reacted, behaved and what kind of support he or she needed.

Nevertheless, the limitations in the project leaders' effort in building trust refer to lack of introducing previous achievements of team members to the others, lack of formal

communication rules or guidelines to facilitate interactions, lack of personal or informal communication besides face-to-face meetings.

Finally, even though differentiating the team stages represents a good way of assessing how trust is achieved during the project life, the project leaders described the process more in terms of initial trust and the trust nurtured throughout the team's life. Describing trust-building for the entire project life was particularly daunting as project leader's actions and behaviour were determined by other contextual factors that did not necessarily conform to the team stages as described by Greenberg et al., (2007). Therefore, even though the questions were asked according to the framework, the answers were intertwined and approached differently. This leads to underlining the complexity of trust building and the importance of contextual and individual factors that play an important role in how trust was perceived and approached.

RQ3: How is leadership behaviour different in virtual projects compared to face-to-face projects?

Previous studies have claimed that task and relationship-oriented leadership behaviours become somewhat more important in a virtual working environment (Bell & Kozlowski, 2002; Zimmerman et al., 2008). Our research study confirms the greater importance of these behaviours in a virtual context and mention that task-related leadership behaviour is higher in the initial and final stages of a team's life, the relationship-oriented behaviour dominating along the other stages of a project development. Moreover, the contingency theory presented by Yoo and Alavi (2004) argues that the leader's behaviour depends on situational factors such as task and organizational conditions. However, our findings support the idea that leaders' behaviour in most instances depended on the people in the team, on their background and experiences rather than the nature of the task. Also, leaders' behaviour is influenced by the time the individual team member has dedicated to that certain project.

Furthermore, when analyzing team members' perspective, we found out that the team members less involved in virtual activities (40% or less) perceived their leader as being equally focusing on task and relations. Meanwhile, while the degree of virtuality of members' activities increases (60% and more), leaders were perceived as more task-oriented. However, the importance of people-oriented behaviour is outlined through the 78.1% of the respondents that mentioned the success of a project to be highly dependent on the project spirit such as trust, good communication and leader's ability to empower.

Concurrently, as part of the task and relations-related leadership behaviour, we identified that the key factors in leading virtually were the effective management of expectations, change management and motivation and empowerment. These factors were perceived by project leaders as equally important in a traditional face-to-face working environment, but because of communication difficulties, cultural and background differences of team members, and constant variance along the way of the projects, these become paramount and more relevant when leading virtually. Moreover, cultural differences rendered empowerment more difficult to achieve because often, some team members were afraid to step out of their role.

Finally, concerning sharing leadership within the team, for a better effectiveness in leading virtually, our findings affirm that shared leadership occurs in teams where members have good leadership skills and it does not apply to decision-making. In our case, team members did not have the same leadership roles as their project leaders, rather their roles represented an extension of their daily tasks in order to stimulate the team processes and team performance. Additionally, shared leadership should be as a facilitator for a better recognition and resolution of problems.

5.2 Contributions

In this section we present our theoretical contributions to existing literature on virtual leadership.

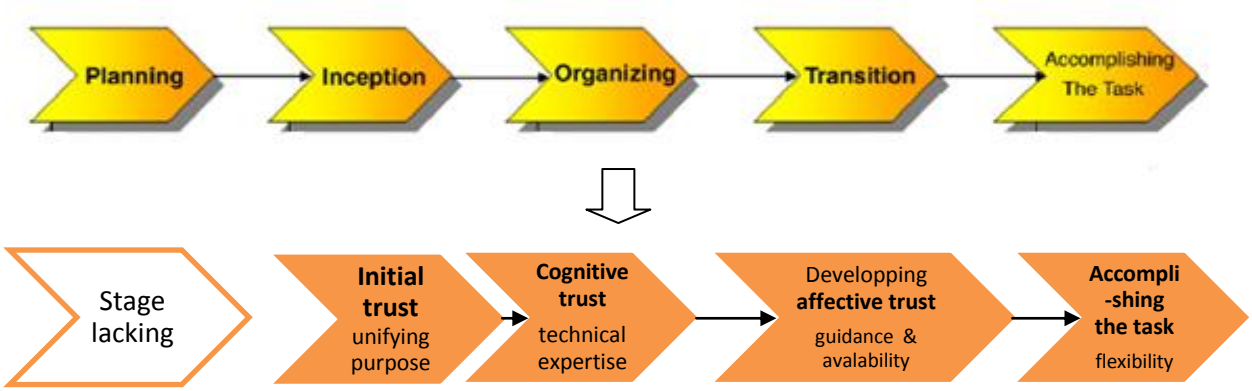
First, our findings extended current literature on e-leadership by taking a step forward from identifying the key challenges of leading virtually by actually exploring how these affect perceived project success and effectiveness. We identified that computer-mediated technology represents a great hindrance to creativity in virtual meetings and virtual projects in general, aspect not mentioned in the literature revised. Moreover, taking into account Figl and Saunders' (2011) description of the technology used in virtual settings, we identified that the technology used by project managers was low in synchronicity and social presence, in spite of the innovative nature of projects, a fact that comprises certain practical implications as well. Moreover, in our study we covered the gap of lack of multi-methods study for virtual project teams, having added team members' perspective. Hence, the challenge of cultural differences was seen by project leaders as a barrier in terms of how team members perceive the achievement of goals and tasks, whereas the team members' perspective focused on the differences in background and experience of the members as a challenge to be taken into account by project leaders. Also, we built on the current literature by showing that conflicts should be viewed as beneficial for teams' dynamics and should be treated as such when leading virtually.

Additionally, concerning task and relationship-oriented leadership behaviours, we extended prior research concerning their application to a virtual setting by applying them to project management and contributed to exploring how these behaviours are manifested across a team's project life. Therefore, our findings confirm that task and relationship oriented behaviours become more important in a virtual setting ((Bell and Kozlowski, 2002; Davis, 2004; Griffith & Meader, 2004; Zimmermann et al., 2008) and reveal that in the case of a virtual project, the task related behaviour is more important at the beginning and end of a project, whereas the relationship oriented behaviour more in the other stages of a project. Also, by including team members' perspective, we could outline that once the degree of virtuality in the participants' daily work increases, task-oriented leadership behaviour becomes more obvious, therefore supporting Zimmermann et al.'s (2008) findings. However, in the case of a low degree of virtuality in the participant's daily work, both relationship and task-oriented behaviours are perceived as important.

Moreover, building on prior literature that has viewed shared leadership in virtual teams especially as beneficial and highly relevant when tasks are complex, our findings support the idea that shared leadership is indeed beneficial for a better coordination of tasks within virtual teams,

but that it is limited in terms of decision-making and is preferred in the teams where there are members distinguishing themselves through good leadership skills.

Finally, the main contribution in our study concerning trust building in a virtual context was to empirically test Greenberg et al.'s (2007) model of trust required in team stages and outline the main components of trust achievement as performed by the virtual project leaders in our research. Therefore, illustratively, Greenberg et al.'s, (2007) model applied to our study can be represented as following:



5.3 Practical implications and recommendations

After discussing the conclusions and theoretical implications of our study, next we present some practical implications for project managers leading virtual projects.

First, we would like to outline the importance of being aware of the challenges to leading virtual projects effectively. Therefore, to overcome the barriers of communication through computer-mediated technology that hinder project managers' approach to leading, trainings and support on the use of different types of technology is essential for minimizing miscommunication and enhancing interaction and social presence of leaders and members. Moreover, organizations that generate virtual projects should develop an appropriate infrastructure that includes alignment of technology across members and organizations. Additionally, besides some cultural trainings mentioned by project leaders, in our research study we perceived a lack of trainings on how to lead virtually. Therefore, derived from our findings we believe that trainings on virtual leadership would be beneficial for mastering techniques for effective formal and *informal* communication, what (virtual) team building activities are more appropriate, how to enhance creativity during virtual meetings and how to make sure people are involved and participative.

Second, project managers should capitalize more on the differences between team members in terms of background and experience and transform them in strength by for instance, structuring subgroups in terms of personality or individual character. Also, project managers can contribute to project effectiveness by creating a culture where people are not afraid to speak up, provide group and *individual* feedback when necessary, be open minded and have empathy for people.

Third, for team cohesion and trust, we recommend project managers to implement formal communication rules and make sure everyone adheres to them, to put some effort into

developing non-task related communication, increase their 'presence' through constant updates concerning the project path, be explicit and monitor change. Even though technology keeps developing every day, the importance of face-to-face meetings did not fade away. Having face-to-face meetings in the beginning of the virtual team's life cycle is of great importance in order to be able to know the team members, to get to know their motivations and build a first important impression of the team. Afterwards, project managers should organize regular and predictable times of the face-to-face meetings as the best way to keep up the team spirit and monitor the project development.

Finally, if possible, the reward structure should be arranged in such a way as to foster cooperation and trust among team members, as for instance introducing incentives for overall team performance.

5.4 Future research

Although we answered our research questions and revealed some interesting facts concerning e-leadership, this thesis motivates additional research.

First, since culture represents an important challenge for effective virtual leadership, future studies should seek to identify the characteristics of virtual leadership that would transcend cultural differences and be universal for leading virtually.
Additionally, as a result of our research, we identified that the differences between office and home virtual settings might influence leadership in a different way, since the members' line between home and work life pales. Therefore, it would be interesting to see how this dimension would impact virtual leadership and trust building.

Concurrently, in our research we included projects with certain degrees of virtuality within traditional organizations. However, we believe that our findings could be complemented by focusing on leadership in virtual organizations, organizations that are created to function independently, having a permanent virtual status and a range of involvement across organizations (Tabari & Kaboli, 2004).
Also, in determining how trust is built within virtual teams, we outlined the additional factors that should be taken into consideration when building a model for obtaining trust in a virtual context. Thus, future studies should seek to address the necessary trust components for every stage in a virtual project team development.

Finally, shared leadership has yielded some important results within our study. Nevertheless, it would be highly interesting to gain deeper insights into the areas that shared leadership would be most appropriate for virtual project success and coordination of tasks and also address *how* to facilitate shared leadership within virtual teams.

To conclude our study, virtual leadership has become a current trend and future preoccupation for organizations worldwide. The growing technological sophistication and organizations' orientation towards new ways of creating value and competitive advantage trough global virtual projects have revealed the need for leaders capable of managing complexity, diversity, uncertainty and change characteristic to virtual projects. The journey to become an effective virtual leader

whose behaviour can transcend these challenges requires deep levels of understanding and incessant development of skills and methods to be able to bridge geographical, cultural, and functional frontiers. This is because virtual leadership is here to stay.

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Appendix 1. Interview Questions

Overarching Themes	Questions	Possible probes (follow-up questions)
General working characteristics of the interviewee	Could you do a brief presentation of yourself? Which company are you currently working for?	
	During your professional career, have you managed only virtual projects, only traditional projects or both traditional and virtual projects?	How many years have you been working with projects? How many in virtual projects?
	Are you currently supervising/leading any virtual projects?	Where do you usually work (office, home)? Do you ever combine office with telecommute?
Characteristics of the team	Are the members of the teams international or are they geographically dispersed within your national borders? (Figure 2.1) Are the teams created with employees from different organizations? (Figure 2.1)	Do you have the same team for more than one project?
	How are the teams created and members selected?	What are the main criteria on which you base your decision?
View on virtual teams	What would you say is the biggest difference between leading / working in virtual teams compared to co-located teams (in the same place)?	Do you enjoy working in a virtual environment?
	What are the pros and cons of working with virtual teams? Do you face some specific challenges/ critical factors when working with virtual projects? What are they? How did you handle them?	
Project success	How do you measure the success of a project? What are the key factors for project success?	Tell us about a project in which the team subsequently considered it a successful experience.
	What are the main barriers specific to the virtual environment that affect project success?	Tell us then about a project that has been experienced as unsuccessful.

	Do you consider project „intangibles" (leader's behaviour, vision, values, emotions, trust etc.) as important as time, budget and quality? Why/why not?	
Task-oriented leadership behaviour	Do you pressure team members in order to obtain productive results? How do you monitor individual progress and quality of work? Do you share leadership within the team? Why/why not?	Is the result more important than how people feel? Is everyone aware of everyone else's progress?
	What available technologies do you use in order to communicate within the team? Which one do you consider to be the most effective? Is there anything missing in your current software that you would like to see implemented?	Do you have favourite software for project management? Does it help to solve the disadvantages of VPM? In which way?
	Are members clear about their roles and responsibilities within the team?	
Relationship-oriented leadership behaviour	How do you communicate your expectations to the team members? How do you provide feedback, coaching and support to the team members? How much autonomy/freedom do team members have in the process of decision-making? What conflict situations where you confronted with during the project time? How did you solve them? How did it affect the project outcomes?	
	How did you handle the time zone and cultural differences, if any? Were there any situations that affected the way you worked? How do you manage to commit all team members?	Did you have to adjust to other cultures? Do you actively build your knowledge of other cultures?
	Stage 1: What do you consider when assembling/establishing the virtual team?	If the members do not have certain characteristics or skills to work in a virtual setting, do you

Trust-building	*Stage 2*: When the team is already put together, (1) do you formally introduce the members and their main achievements to the others, (2) do you organize team-building activities, (3) do you create any rules of engagement within the team? If yes, could you please describe the processes?	provide any training? What is the organisation's reward structure (competitive/cooperative rewards)?
	Stage 3: How do you acknowledge team members' contributions? Do you think participation of the team members in organizing the project activities is a good idea? Do you monitor how communication is flowing among team members?	
	Stage 4: How do you ensure that members are informed and clear about everything concerning the accomplishment of tasks?	Do you usually look at the team as a whole or as formed of individual members with clear roles?
	Stage 5: Were there any significant delays in accomplishing the task? Do you celebrate the achievement of interim deadlines? Why/why not? On each of the stages above, do you put more emphasis on goal achievement, setting tasks, achieving outcomes and deliverables, or do you focus more on communication, organization of interactions among members, emphasizing shared values and norms? Have you established any specific communication guidelines or other rules to enhance communication and exchange of information, ideas?	
	What challenges have you encountered in the process of trust building?	How frequently do you communicate with the team members?

Appendix 2. Questionnaire - Virtual Team Members

Dear Virtual Team Member,
The following questionnaire has been developed to explore leadership and trust-building in virtual teams.
You have been chosen to participate in this survey because you are or have been a member of a virtual project team and have valuable knowledge that is important for our study.
The survey should only take approximately 10 minutes of your time and the answers will remain anonymous after your participation.
When completing the survey it is important that you answer all the questions. The result of your answers will be of value to both virtual project teams and leaders in the future.
We really appreciate your assistance in this survey!

To be filled in by the team leader:

1a. Please specify the virtual project you are referring to when filling in this questionnaire:	_____
2a. What was the project duration?	_____
3a. The size of the virtual project team was Please note that *virtual teams* are geographically and/or communication and information technologies in order to accomplish a specific goal organizationally dispersed and collaborate via	3a. Fewer than five people 3b. Between five and ten people 3c. Between 10 and 20 people 3d. Between 20 and 30 people 3e. More than 30 people 3f. The size of the team varied considerably
4a. The team members were from	4a. 1 country 4b. 2-4 different countries 4c. 5-6 different countries 4d. 7-8 different countries 4e. 9 or more different countries
5a. How often did your virtual team meet in person?	5a. Never 5b. Once during the project 5c. Twice during the project 5d. Three times during the project 5e. More than 3 times during the project

6a. Which of the following tools did you use to communicate and collaborate with your virtual team? (Select all that apply).	6a. Email 6b. Fixed phone 6c. Mobile phone or other mobile device 6d. Video conferencing 6e. Web conferencing/Virtual meeting space (eg,WebEx) 6f. Shared calendar/project plans 6g. Instant messaging (eg, MSN Messenger) 6h. Voice over IP tools (eg, Skype) 6i. Online discussion forum 6j. Web-based real-time messaging tools (eg, Campfire) 6k. Bespoke systems 6l. Wiki 6m.Social network site (eg, Facebook) 6n. Online office suite (eg, Google Docs) 6o. Blog 6p. Governance tools (eg, MetaTeam) 6q. Other (Please specify):_____

To be filled in by the team members:

1. Please select the virtual project you were part of (the project leader is indicated in parentheses):	1a. (Sean Watts) FBW 1b. (Maria Forss) DuoCort Pharma 1c. (Ullrika Allgén) Dapagliflozin Clinical Project Team 1d. (Mattias Holgersson) Metis 1e. (Erik Woerdeman) Sapphire 1f. (Rickard Westerberg) Aurora Latin America Project 1g. (Antonio Vizzino) Projects running in Innovation Board SKF
2. My main functional role within the team was (Please choose maximum 3):	2a. Strategy and business development 2b. Finance 2c. General management 2d.Marketing and sales 2e. Project management 2f. IT 2g. Risk 2h. Customer service 2i. Operations and production 2j. R&D 2k. Human resources 2l. Information and research 2m.Legal 2n. Supply-chain management 2o. Procurement 2p. Other (please specify):_____
3. Which of the following best	3a. That was the only way I worked

represents the amount of time you spent working within the virtual team?	3b. At least 80% of my time 3c. About 60-80% of my time 3d. About 40-60% of my time 3e. About 20-40% of my time 3f. About 10-20% of my time 3g. 10% or less of my time
4. The most challenging factors in working within the virtual team were (Please select all that apply)	4a. Computer-mediated communication 4b. Cultural differences 4c. Time zone 4d. Language 4e. Coordination of tasks 4f. Trust-building 4e. Other (Please specify):_____
5. Which of the following tools do you think were the most efficient to communicate and collaborate with your virtual team? (Please select all that apply).	5a. Email 5b. Fixed phone 5c. Mobile phone or other mobile device 5d. Web conferencing/Virtual meeting space (eg,WebEx) 5e. Video conferencing 5f. Shared calendar/project plans 5g. Instant messaging (eg, MSN Messenger) 5h. Voice over IP tools (eg, Skype) 5i. Online discussion forum 5j. Web-based real-time messaging tools (eg, Campfire) 5k. Bespoke systems 5l. Wiki 5m.Social network site (eg, Facebook) 5n. Online office suite (eg, Google Docs) 5o. Blog 5p. Governance tools (eg, MetaTeam) 5q. Other (Please specify):_____
6. I would describe the team leader as (for that specific virtual project) (Please select maximum three options):	6a. Focusing on accomplishing the task 6b. Focusing on people, on creating relations among team members 6c. Motivating and empowering 6d. Giving little guidance and support 6e. Communicating in a distant manner 6f. Other (please specify):_____
7. The most important factors that contribute to project success in	7a. Correct selection and integration of information technology tools for communication

virtual teams in my opinion are (Please select maximum three):	7b. Clear objectives, roles and responsibility 7c. Stakeholder and customer satisfaction 7d. Leader's building activities (focusing member's emotions, attitudes, and norms on expected outcomes). 7e. Cultural understanding and adjustment 7f. Project spirit (trust, good communication, leader's ability to empower, motivate).				
To what extent do you agree with the following statements?					
8. I trusted the other members' knowledge and expertise	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
9. I had a clear role and clear tasks assigned within the team	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
10. My team leader replied promptly to any of my inquiries or questions	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
11. My team leader provided us with accurate and unbiased feedback regarding individual and team performance	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
12. My team leader implemented communication guidelines within the team	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
13. My team leader acknowledged my achievements individually and to the other team members	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
14. I felt I knew the other virtual team members well	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
15. I felt that I could count on the other team members for help or support	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
16. My team often exchanged information about topics other than work (eg, personal interests)	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
17. My team experienced misunderstandings or conflicts during the project	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
18. I think the project manager's way of leading was suitable and efficient for the virtual setting	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5

Appendix 3. Answers Questionnaire-Likert scale

Question	Distribution	Mean	Standard Deviation
8. I trusted the other members' knowledge and expertise:	Strongly disagree: 0.0% Disagree: 0.0% Neutral: 3.1% Agree: 25.0% Strongly agree: 71.9% Not applicable: 0.0%		
9. I had a clear role and clear tasks assigned within the team:	Strongly disagree: 0.0% Disagree: 6.3% Neutral: 6.3% Agree: 25.0% Strongly agree: 62.5% Not applicable: 0.0%	4.4	0.9
10. My team leader replied promptly to any of my inquiries or questions:	Strongly disagree: 0.0% Disagree: 6.3% Neutral: 3.1% Agree: 25.0% Strongly agree: 65.6% Not applicable: 0.0%	4.5	0.8
11. My team leader provided us with accurate and unbiased feedback regarding individual and team performance:	Strongly disagree: 0.0% Disagree: 3.1% Neutral: 12.5% Agree: 37.5% Strongly agree: 46.9% Not applicable: 0.0%		
12. My team leader implemented communication guidelines within the team:	Strongly disagree: 3.1% Disagree: 0.0% Neutral: 12.5% Agree: 43.8% Strongly agree: 40.6% Not applicable: 0.0%	4.2	0.9
13. My team leader acknowledged my achievements individually and to the other team members:	Strongly disagree: 0.0% Disagree: 6.3% Neutral: 6.3% Agree: 28.1% Strongly agree: 59.4% Not applicable: 0.0%	4.4	0.9
14. I felt I knew the other virtual team members well:	Strongly disagree: 0.0% Disagree: 3.1% Neutral: 21.9% Agree: 40.6% Strongly agree: 34.4% Not applicable: 0.0%	4.1	0.8
15. I felt that I could count on the other team members for help or support:	Strongly disagree: 3.1% Disagree: 9.4% Neutral: 6.3% Agree: 28.1% Strongly agree: 53.1% Not applicable: 0.0%		
16. My team often	Strongly disagree: 3.1%	3.3	0.9

exchanged information about topics other than work (eg, personal interests):	Disagree: 9.4% Neutral: 43.8% Agree: 25.0% Strongly agree: 9.4% Not applicable: 9.4%		
17. My team experienced misunderstandings or conflicts during the project:	Strongly disagree: 6.3% Disagree: 21.9% Neutral: 15.6% Agree: 40.6% Strongly agree: 15.6% Not applicable: 0.0%	3.4	1.2
18. I think the project manager's way of leading was suitable and efficient for the virtual setting:	Strongly disagree: 3.1% Disagree: 3.1% Neutral: 3.1% Agree: 31.3% Strongly agree: 59.4% Not applicable: 0.0%		

Appendix 4. Project leaders' background

Maria Forss	Maria has been working with different virtual teams for the last 17 years. The first 14 years at AstraZeneca she was involved in different virtual projects that included countries such as US, UK, and Japan. After AztraZeneca she worked as a project manager and CEO at DuoCort Pharma, which was a virtual company. During her time at DuoCort Pharma, she led a 3-year virtual project. Currently, Maria is working at Vitrolife Sweden AB. Maria has also received the price for the Project Leader of the year in 2012.
Ulrika Allgén	Ulrika has had different project management roles within AztraZeneca for many years. There is always some degree of virtuality in the projects at AztraZeneca. The project Ulrika used as an example during the interview was where she acted as a program director. The core of the team was mainly dispersed between US and Sweden and between two different organizations. There was also an extended team connected to the project that was dispersed in 16 different countries.
Mattias Holgersson	Mattias has been working for SKF since 2000. He has been working with engineering consultancy services in different regions and countries around the world such as India, US, the Netherlands and the Nordic countries. The bigger projects during the last two years have been mainly virtual while the projects in his previous role before 2012 were more traditional or hybrid. The current project is both geographically and organizationally dispersed, including members from different business areas and countries, such as the Netherlands, Sweden, US, Germany and France.
Sean Watts	Sean is working as Innovation Board Program Manager at SKF. Before joining SKF, he was responsible for project management for around 160 project managers on 3 different continents. He has been working with both traditional and virtual teams. The team members Sean is currently supervising are internationally and geographically dispersed between India, China and US, for instance. They are also organizationally dispersed with external resources being included from companies in London, consultancies in Sweden and France.
Erik Woerdeman	Erik is a consultant who has been working for SKF since 2011. Before SKF he worked for several automotive companies and since 2001 has mainly worked for different projects. He is currently supervising a project that is in the closing phase and is also working in the pre-study of another virtual project in Gothenburg which will include Sweden, the Netherlands and US. The project which is in the closing phase is between France and the Netherlands.
Rickard Westerberg	Rickard has been working in Sandvik Argentina for the last 4-5 years, being responsible for the implementation of an ERP system in Latin America. The project team is a mix of people from local organizations within each Latin country and the core team which includes members from the US, Europe and Australia. Being such an international and virtual team, each member works at home, the biggest part of the communication being achieved through computer technologies.
Antonio Vizzino	Antonio is a project manager and has a collection of different teams within SKF, having managed both virtual and traditional ones. The team he is currently leading is virtual, with international dispersed team members. The team is together by visual operations, they are all different line managers but working under the same operational department and located everywhere in the world. Sometimes he doesn't even know where his colleagues are in the world in different periods.