

UNIVERSITY OF TAMPERE
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CHALLENGES IN DEVELOPING VIRTUAL TEAMS
CASE: KONE CORPORATION

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Supervisor: Kari Lohivesi

Jarkko Hedman

ABSTRACT

University of Tampere Department of Management Studies, Management and Organization

Author: HEDMAN, JARKKO

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The members of a virtual team work in separate places, countries and continents, and they communicate via information and communication technology. Since virtual activity differs from conventional in several ways, completely new skills are required from employees and supervisors. The objective of this Master's Thesis was to study the challenges a global virtual team may face. Ways to overcome these challenges were also considered. The study was executed in association with a Finnish multinational company, KONE Corporation, in which the amount of virtual teams is increasing rapidly.

The study was conducted by first examining literature in the field of virtual teams. The challenges were grouped into four main dimensions of virtual work: challenges caused by separate locations, asynchronism, diversity of employees, and mode of interaction. The same grouping method was used when the empirical data was gathered and analyzed. Empirical research was conducted within KONE Corporation's Global Information Services organization with the help of survey questionnaires, semi-structured interviews, as well as participant observation.

The findings of the study reveal that virtual teams are facing several challenges regarding the dimensions of virtual work mentioned earlier. The challenges in virtual teams of KONE Global Information Services are typical: ones identified in the literature and ones that almost every virtual team faces. Moreover, it was concluded that in virtual work environment the supervisor has an essential role. Creating and maintaining virtual presence is one of the key tasks for a virtual team leader.

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Virtuaalisen tiimin jäsenet työskentelevät eri paikoissa, maissa ja maanosissa käyttäen apunaan tieto- ja viestintäteknologiaa. Koska virtuaalinen toimintatapa poikkeaa perinteisestä monella tavalla, työntekijöiltä ja esimiehiltä vaaditaan aivan uudenlaista osaamista. Tämän pro gradu -tutkielman tavoitteena oli tutkia millaisia haasteita kehittyvä kansainvälinen virtuaalinen tiimi kohtaa. Lisäksi pohdittiin, millaisella johtamistavalla nämä sudenkuopat voidaan ylittää. Tutkimus tehtiin yhteistyössä suomalaisen monikansallisen yhtiön, KONE Oyj:n, kanssa. Virtuaalisten tiimien määrä yrityksessä kasvaa nopeasti.

Tutkimusaiheen käsittely aloitettiin tutustumalla aihealueen kirjallisuuteen. Virtuaalisen tiimin haasteet ryhmiteltiin neljään pääulottuvuuteen: eripaikkaisuudesta, eriaikaisuudesta, työntekijöiden moninaisuudesta sekä vuorovaikutuksen tavasta aiheutuviin haasteisiin. Sama ryhmittelytapa toimi perustana empiirisen tiedon keräämisessä ja analysoimisessa. Empiirinen tutkimus toteutettiin KONE Oyj:n Global Information Services -organisaatiossa kyselylomakkeiden, teemahaastattelujen ja osallistuvan havainnoinnin avulla.

Tutkielman tulokset osoittivat, että virtuaaliset tiimit kohtaavat lukuisia haasteita edellä mainittuihin virtuaalisen työn neljään ulottuvuuteen liittyen. Haasteet KONE Global Information Services -organisaatiossa ovat tyypillisiä kirjallisuudessa tunnistettuja kaikkien virtuaalisten tiimien kohtaamia haasteita. Lisäksi todettiin, että virtuaalisessa toimintaympäristössä tiimin esimiehen asema korostuu. Virtuaalisen läsnäolon tunteen luominen on yksi virtuaalisen tiimin johtajan päätehtävistä.

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1 INTRODUCTION

In today's business environment, teams have been accepted as the good way to organize for flexible and cost-effective operations. With recent advances in technology, however, team members no longer must be housed in one location in order to work together. They can become virtual teams – teams with a common purpose that use technology to cross time zones, distances, and the boundaries of organizations.¹

Multinational companies increasingly rely upon the work of virtual teams to manage their global intellectual assets and encourage innovation. Virtual teams allow companies to leverage their global expertise, take the pulse of diverse markets, promote broader participation in key strategic decision making, increase job flexibility, lower travel costs and pool the knowledge of experts.²

“Virtual teams” is one of the many hot topics in business these days. But unlike a fad, it appears to have staying power. While the use of virtual teams continues to grow, the understanding of how their many unique characteristics work or do not work together lags far behind.³ There is plenty of literature on virtual organizations and teams but the research is mainly conceptual⁴. There is a real need of empirical studies, especially on more precise phenomena in work situations. What is lacking is a holistic view on the situation of individual users. What actually occurs on the micro-level when information and communication technologies are brought into and increasingly used to support communication, knowledge sharing and work performance in organizations?⁵

According to researchers, in the most cases, virtual teamwork is not functioning very well. Conventional ways of working are deep-seated and people are willing to continue doing what they have been doing for a long time. When problems appear, the most

¹ Lipnack & Stamps 1999, 17.

² See more from Vartiainen, Kokko & Hakonen 2004a, 17; Gould 2000, <<http://www.seanet.com/~daveg/vrteams.htm>>.

³ Pauleen 2004, viii.

⁴ E.g. Gripenberg 2002, 104; Kokko, Hakonen & Kuokkanen 2004, 2.

⁵ Gripenberg 2002, 104–105.

ordinary and secure solution is to let the separate units work as earlier – alone and independently. However, the traditional methods do not support sharing good practices, skills, and innovations across units.⁶ This is one of the main reasons why virtual teams fail. People overlook the implications and do not make accommodation for how different it really is when they and their colleagues no longer work face-to-face.⁷ In addition, they do not sit down and consider how virtual teamwork challenges the leadership⁸. What is the role that team leaders should play, and what types of interventions can the managers use to launch and sustain virtual teams⁹?

Too often, solutions for the challenges of virtual teamwork are tried to solve by using the latest information and communication technologies. However, technology is only a medium of collaboration and cannot respond to the fundamental problems of human interaction. Technology develops constantly but human nature stays the same: The members of a virtual team have the same needs for discussion and exchange that a conventional team has.¹⁰ The technology will not work unless the people issues are addressed first. Working in a virtual environment requires a new kind of organization, a new kind of management, and a new kind of leadership.¹¹ Understanding the context of virtual work environments is an essential prerequisite for effective action. This study is to provide a holistic view on the challenges of virtual teamwork.

1.1 Background of the study

How does this study fit into the reality of the business world and why was this research conducted? In January 2005 a new organization was formed within the large multinational company, KONE Corporation, which manufactures and services elevators and escalators as well as services automatic building doors. 400 information systems professionals from all over the world integrated into one large organization under the name KONE Global Information Services (KONE GIS). The idea of the integration was

⁶ Vartiainen, Kokko & Hakonen 2004a, 18.

⁷ Lipnack & Stamps 2000, 19.

⁸ Kokko, Hakonen & Kuokkanen 2004, 2.

⁹ Kerber & Buono 2004, 4.

¹⁰ Bock 2003, 43.

¹¹ Lipnack & Stamps 1999, 17–18.

to increase collaboration across unit and national borders and thus gain synergy effects all the units could profit from. The main driver for the change was the fact that most of the information systems were already globally organized.¹²

The integration process demanded a new organizational structure. The teams were no longer locally structured – KONE GIS became a truly virtual organization. The members of the same team may be working in different continents and meet face-to-face only once a year or less. In spite of the promising start, new working methods have been difficult to adopt and the organization fails to work to the desired degree. Thus there is currently a need to improve the quality of virtual working within KONE GIS. That is to say, the need of the case company was what initiated this study.

1.2 Research objectives

The purpose of this Master's Thesis is to describe the challenges in developing virtual teams at KONE Corporation and especially in KONE Global Information Services organization within it. The challenges consist of both the negative and the positive elements affecting virtual teamwork. The main research question guiding this study is as follows:

- What kinds of challenges may a virtual team face in the developing stage?

The main research question is further divided into the following sub-questions:

- What kinds of challenges caused by working in different places may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by mobile way of work may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by different time zones may a virtual team face, especially in the developing stage?

¹² More extensive information on the case company is presented in the sub-chapter 5.3.

- What kinds of challenges caused by the nature of temporariness may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by the diversity of team members may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by modes of interaction may a virtual team face, especially in the developing stage?

The sub-questions arise from a theoretical framework¹³ used in this study presented in the sub-chapter 2.2.1. This study does not focus on management and leadership in virtual teams. To understand virtual teamwork better, some of the challenges need to be discussed in the leadership and management point of view as well.

1.3 Definitions

Team

One of the most accepted definitions for a conventional team comes from Katzenbach & Smith¹⁴: A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.

Virtual team

There are several different definitions of virtual teams, but what these definitions have in common is that in addition to being a team, virtual team members are physically separated and primarily interact electronically.¹⁵ According to Lipnack & Stamps¹⁶, a virtual team, like every team, is a group of people who interact through interdependent tasks guided by common purpose. Unlike conventional teams, a virtual team works across space, time, cultures and organizational boundaries with links strengthened by

¹³ Vartiainen, Kokko & Hakonen 2004a, 20–22.

¹⁴ Katzenbach & Smith 1993, 45.

¹⁵ Gould 2000, <<http://www.seanet.com/~daveg/vrteams.htm>>.

¹⁶ Lipnack & Stamps 2000, 18–19.

webs of communication technologies.¹⁷ According to another definition, a virtual team may be a temporary or permanent group of people, the members of which are working in different places by using information and communication technology to achieve common objectives. This approach takes into account the continuity (temporariness versus permanency) of teamwork in terms of time.¹⁸ Face-to-face interactions among people from the same organization typify old models of teamwork; the key point setting virtual teams apart is that they routinely cross boundaries¹⁹.

Developing virtual team

Most organizational researchers and authors acknowledge that team life is a process. Popular and academic studies alike agree on the general outlines of the basic team life cycle. Tuchman's²⁰ 1960's model of the stages of small-group development is the most commonly used theory.²¹ The model of the stages of small-group development consists of the four following stages (see the Figure 1):

- *Forming*: Individuals are trying to get to know each other and the organization. A commitment to the team effort has not yet been formed. It is natural for members to practice denial. Unresolved fears about the change and mistrust of new team members need to be replaced by acceptance and a sense of membership in order for the team to move on. Leaders must allow time for trust-building activities.
- *Storming*: This stage naturally occurs when a group is struggling with assuming an identity. Storming is a critical period of letting go of old norms and relationships and becoming emotionally prepared for new ones. In this rocky stage, team members may challenge the leader and each other. Team members may experience conflict, manifested by anger, blaming, anxiety or withdrawal. The leader role in this stage is to coach members on how to manage conflict and focus on goals.

¹⁷ Lipnack & Stamps 2000, 18–19.

¹⁸ Vartiainen, Kokko & Hakonen 2004a, 220.

¹⁹ E.g. Vartiainen, Kokko & Hakonen 2004a; Lipnack & Stamps 2000.

²⁰ Tuchman 1965.

²¹ Lipnack & Stamps 2000, 126; Vartiainen, Kokko & Hakonen 2004a, 192.

- *Norming*: After individuals have worked through conflicts, things start to fall into place. Members finally begin to explore their new roles in the group. They appreciate their differences and work together. The leader now serves as a facilitator, offering encouragement and guidance. Leader's comments help members identify both individual roles as well as the overall role of the group.
- *Performing*: In this stage, members of the team have established a pace and a shared language. The team is fully functional, able to manage their relationships, and work towards shared goals. The significant obstacles have been removed. Team members feel accepted and communicate openly with the leader. The leader focuses on delegating responsibilities and identifying when the team is moving into a different stage.²²

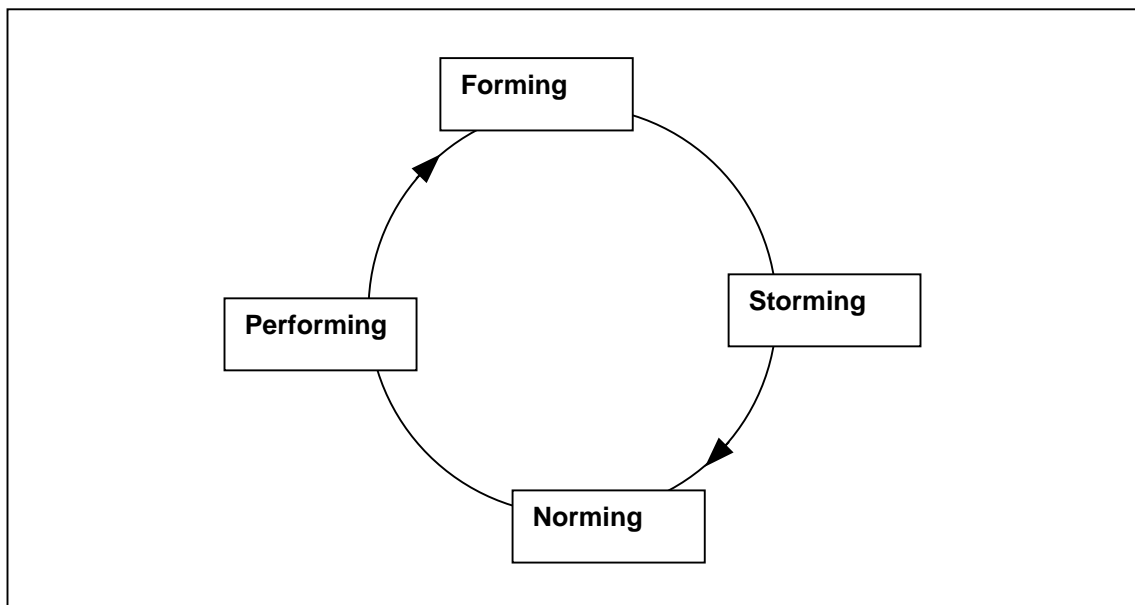


Figure 1. Model of the stages of small-group development.²³

In this study the three first stages of Tushman's team development model; forming, storming, norming; are used in order to define the developing stage of a virtual team.

However, development processes of different teams have similar stages and events. They do not always occur in the same order. The content and order of the stages depends on the mutual experiences, the current assignment and the operational

²² Henderson-Loney 1996, 3–5.

²³ Tushman 1965.

environment. If members of the team have previous experience in virtual teamwork, many of the pitfalls can be avoided. New teams typically use a lot of time for launching the project and establishing the rules and policies.²⁴

Web conferencing

Web conference is a software service that enables the members of a team to take part in a meeting in real time and share their desktop with multiple guests over the Internet. The participants of a web conference work on their own workstations or PCs.²⁵

Collaborative Software

Collaborative software, also known as groupware,²⁶ is application software that integrates work on a single project by several concurrent users at separated workstations²⁷. Collaborative software offers teams and projects several applications and tools such as e-mail, a shared workspace and a calendar²⁸.

1.4 Limitations

There are different forms of virtual teams²⁹. This study focuses on the global virtual teams working within one company. The members of a global virtual team are working in different countries or even in different continents. They face, for instance, the challenges of time zone differences and multicultural work environment.

The empirical study is done via researching technology-mediated relational communication, and therefore some advantages and disadvantages of different kinds of information and communication technologies are discussed. However, this study is not

²⁴ Vartiainen, Kokko & Hakonen 2004a, 72.

²⁵ Vartiainen, Kokko & Hakonen 2004a, 218.

²⁶ "Definition of Collaborative Software". Wikipedia – The Free Encyclopedia <http://en.wikipedia.org/wiki/Collaborative_software>.

²⁷ Vartiainen, Kokko & Hakonen 2004a.

²⁸ Vartiainen, Kokko & Hakonen 2004a, 224.

²⁹ E.g. Duarte & Snyder 1999, 6; Vartiainen, Kokko & Hakonen 2004a, 21–22; Fisher & Fisher 2001, 47–48; Järvenpää & Leidner 1998.

interested in the different technologies themselves, but in their role as a collaboration medium.

Administering cross-national virtual teams is challenging since economic, legal, and political environments vary a great deal from country to country. Here the focus lies more on the “soft” dimension of virtual teamwork, such as interaction between team members and leadership.

Moreover, rewarding in virtual teams is not discussed here due to its complexity³⁰. The subject requires more specific research than this study as a holistic review can provide.

1.5 Structure of the study

This study consists of the following seven chapters:

1. *The first chapter* is an introduction. It describes first why the field of study is interesting and topical. It gives some background information on the case company, KONE Global Information Systems, and explains why this study was conducted. Next it states the purpose and aim of the study. Some important definitions are explained and, finally, limitations of the study are established.
2. *The second chapter* is the first part of the theoretical framework of the study. It discusses the change towards the new world of virtual network organizations. Secondly, the dimensions of virtual work are presented in order to increase understanding of the environment the teams are working in.
3. *The third chapter* is the second part of the theoretical framework of the study. It discusses the specific challenges of virtual teams identified by the literature. The challenges are categorized according to the dimensions of virtual work invented by Vartiainen, Kokko & Hakonen³¹.
4. *The fourth chapter* outlines the methodology used for the empirical part of the study. Some methodological underpinnings are presented first, after which the research design is discussed. Subsequently follows the presenting of data

³⁰ E.g. Vartiainen 2005.

³¹ Vartiainen, Kokko & Hakonen 2004a, 22.

collection and data analysis processes used in the empirical study. Lastly, the questions of validity and reliability of the study are put forward.

5. *The fifth chapter* introduces KONE Corporation. First, the history of KONE Corporation is shortly presented and after that the employees discussed. Then, the focus turns to the case organization in this study, KONE Global Information Services.
6. *The sixth chapter* is the empirical study. The challenges in developing virtual teams in the case organization are in-depth discussed. The challenges are categorized according to the dimensions of virtual work invented by Vartiainen, Kokko & Hakonen³² like in the literature review.
7. *The seventh chapter* as a concluding chapter of the study will summarize major findings under the dimensions of virtual work. Implications from the managerial point of view are also presented, followed by suggestion for further research.

³² Vartiainen, Kokko & Hakonen 2004a, 22.

2 VIRTUAL WORK ENVIRONMENT

This chapter is the first part of the theoretical framework of the study. It discusses the change towards the new world of virtual network organizations. Secondly, the dimensions of virtual work are presented in order to increase understanding of the environment the teams are working in.

2.1 Virtual teams and network organizations

2.1.1 Network organizations

Network organizations and virtual teams are the latest stage in the evolution of organization. In the nomadic era, the small group was the first organization people invented. Hierarchy evolved rapidly in the agricultural era, as towns of 10,000 or more developed. The industrial era required a more robust form of organization – so bureaucracies emerged. And finally, as humans moved into the information era, another form of organization, network organization, began to appear.³³ A network organization is a set of connections of different parts and locations of one organization or different organizations³⁴ where actions are coordinated by contracts and agreements rather than through a formal hierarchy of authority³⁵. There are networks of organizations, companies, as well as nations³⁶.

There are various kinds of network organizations, differing in the interrelationships of the parties functioning in them, and these different types can be described in several ways³⁷. Lipnack & Stamps³⁸ separate network organizations from each other using the two following continuums: distance over space and time, and organizational distance

³³ Lipnack & Stamps 1999, 14.

³⁴ Vartiainen, Kokko & Hakonen 2004a, 19–20.

³⁵ Jones 2001, 121.

³⁶ Lipnack & Stamps 1999, 14.

³⁷ Vartiainen, Kokko & Hakonen 2004a, 64.

³⁸ Lipnack & Stamps 2000, 62.

(see the Figure 2). Space and time vary from functioning in the same place and on the same time zone to functioning globally on different time zones. A company functions in one place, on the same district in several locations, or dispersed around the world. Organizational distance varies from working inside one organization to network cooperation between different organizations.³⁹

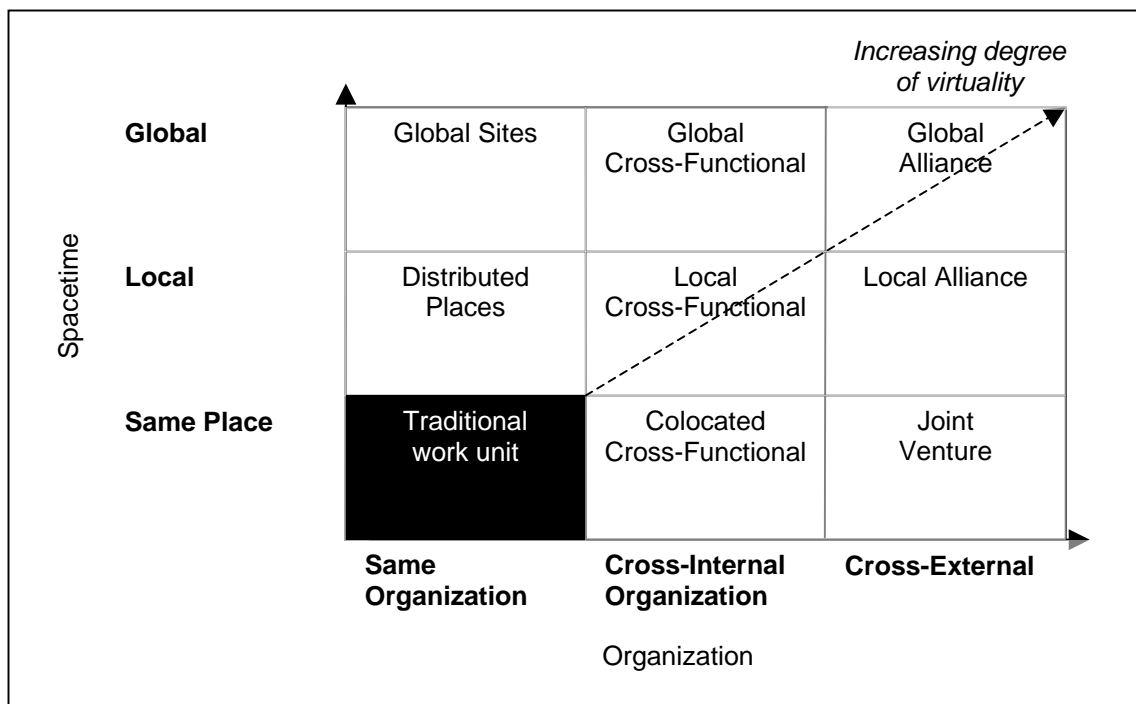


Figure 2. Varieties of network organizations.⁴⁰

2.1.2 Virtual teams as part of network organizations

As network organizations developed, companies explored more flexible structures in order to cope with the challenges and demands of the changing business environment. Virtual teams emerged.⁴¹ Virtual teams and projects became basic cells or fractals of the network organization as in the following figure (Figure 3). The characteristics of the entire network organization can be seen in cells and fractals.⁴² In addition to dispersion by spacetime⁴³, these organizations are defined by working at different times and by the

³⁹ Lipnack & Stamps 2000, 62.

⁴⁰ Lipnack & Stamps 2000, 62.

⁴¹ Lipnack & Stamps 1999, 14.

⁴² Vartiainen, Kokko & Hakonen 2004a, 19–20.

⁴³ Lipnack & Stamps 2000, 62.

diversity of the employees, including different cultural and lingual backgrounds. These kinds of organization forms consist of, for instance, decentralized management teams, R&D projects, and project teams, which are executing customer assignments⁴⁴.

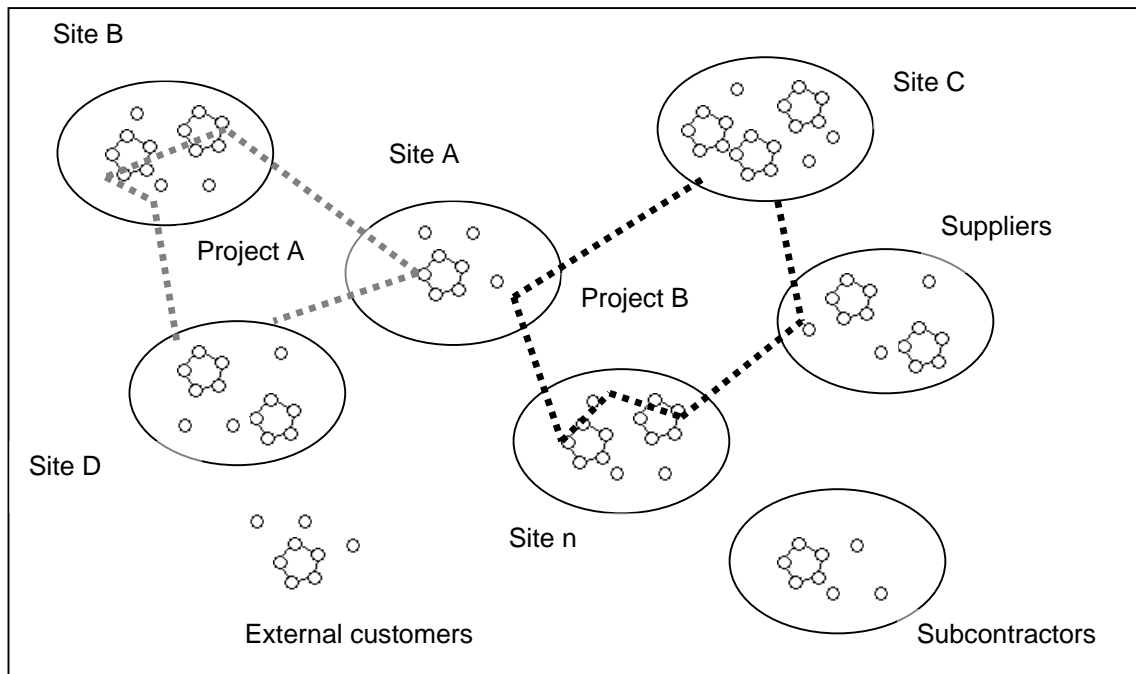


Figure 3. Virtual teams and projects as basic cells of a network.⁴⁵

Although virtual teams have been emerging since we moved to the Information era, the idea is not completely novel. Historians and anthropologists have described many kinds of mobile groups of people, which were working far away from home and each other. For instance, in ancient times, Nomads traveled with their families for the most part of the year and when the summer came they assembled together for agreeing on common issues.⁴⁶ Since the beginning of trade, virtual teams as a method of organizing work still increased. Representatives of manufacturers, agents, traders, and buyers exchanging goods and credit over distance become very general. They were using sophisticated protocols and technology available. Today, organizations and management are practically using virtual teams by default⁴⁷. As we have moved into the 21st century, the

⁴⁴ Vartiainen, Kokko & Hakonen 2004a, 19–20.

⁴⁵ Vartiainen, Kokko & Hakonen 2004a, 20.

⁴⁶ Vartiainen, Kokko & Hakonen 2004a, 15.

⁴⁷ Pauleen 2004, ix.

broad array of communication options permits the refiguring of our organizations in order to meet the rapidly changing demands of the business environment⁴⁸.

2.2 Dimensions of virtual work

Researchers have described the virtual work environment through dimensions⁴⁹. Understanding these variables is important in determining what kind of virtual teams one is leading or working in, and in helping one to make decisions on appropriate actions to improve them⁵⁰. This sub-chapter is to introduce the latest model of dimensions of virtual work⁵¹. This model also gives a framework for studying the challenges in developing virtual teams in the second part of the literature review as well as in the empirical study of this study.

2.2.1 Dimensions of virtual work

Vartiainen, Kokko & Hakonen⁵² use the dimensions of place, time, diversity, and mode of interaction to create a diagnostic model for virtual work. Each dimension is a separate one, in which the level ranges from similar to different as follows (see the Figure 4):

- *Place* (consists of two sub-dimensions):
 - *Location*: actors are working in the same location face-to-face or geographically dispersed in different places.
 - *Mobility*: actors may be physically mobile and change their workplaces or they stay in a fixed place working mainly in one location.
- *Time* (consists of two sub-dimensions):
 - *Time*: actors work either synchronously or asynchronously in different time zones or sequentially in a same time zone.

⁴⁸ Lipnack & Stamps 2000, 14.

⁴⁹ E.g. Vartiainen, Kokko & Hakonen, 20–22; Fisher & Fisher 2001, 42–50; Lipnack & Stamps 2000; Järvenpää & Leidner 1998.

⁵⁰ Fisher & Fisher 2001, 42–45; Vartiainen, Kokko & Hakonen 2004a, 20–22.

⁵¹ Vartiainen, Kokko & Hakonen 2004a, 20–22.

⁵² Vartiainen, Kokko & Hakonen 2004a, 21.

- *Temporariness*: the collaboration of actors and their social structure may be permanent or temporary.
- *Diversity*: the background of actors, i.e. their culture, education, sex, nationality, religion, language, etc, is similar or different.
- *Mode of interaction*: communication and collaboration take place directly face-to-face or mediated via different media and technological systems.

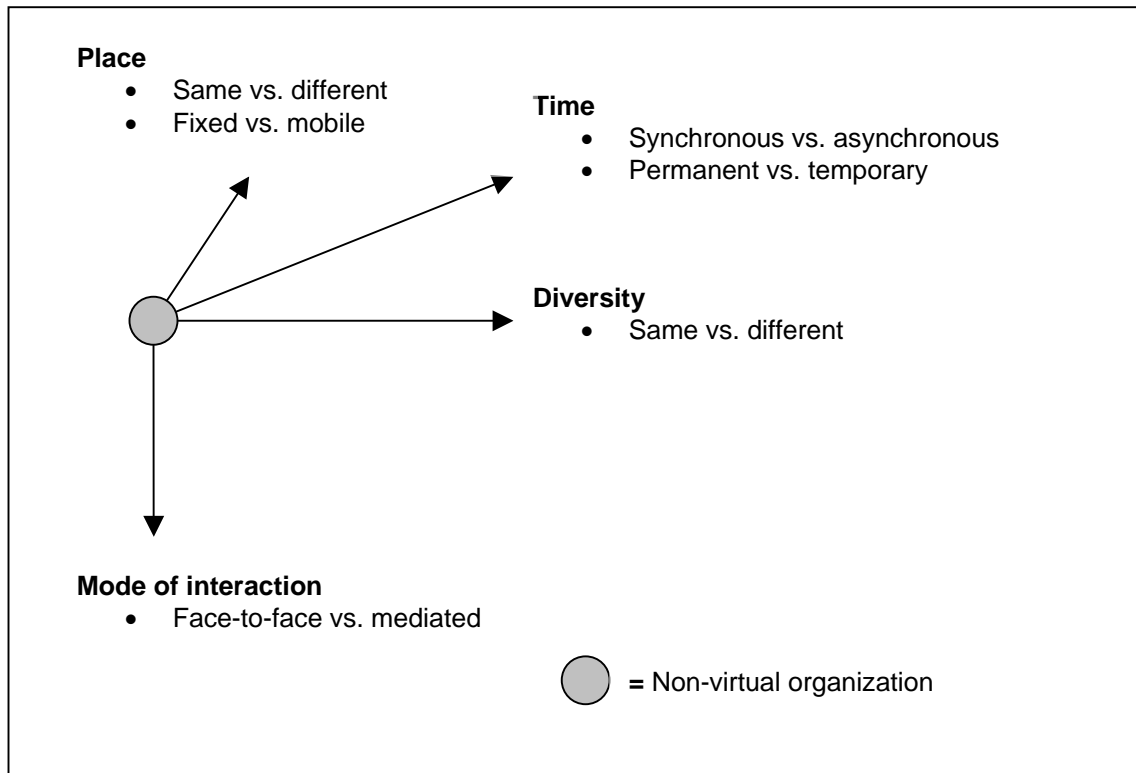


Figure 4. Dimension of virtual work.⁵³

In a non-virtual team, employees similar to their cultural and national background work in the same room, at the same time, and communicate face-to-face. In a wholly virtual team, members of a temporary team with completely different cultural backgrounds all work in different places at different times, constantly moving and communicating through electronic media only. Working on a shared objective also takes place in a virtual space. In practice, virtual teams are seldom fully virtual even in the sense that they would communicate via electronic media only. Instead, they often function through both planned and random face-to-face meetings. Complex tasks often require the most interaction and communication, which traditionally works best face-to-face. However,

⁵³ Vartiainen, Kokko & Hakonen 2004a, 22.

often this is not possible, and in those cases one must resort to technology.⁵⁴ Virtuality is a matter of degree⁵⁵. The degree of virtuality varies according to the dimensions of virtual work described previously: the amount of face-to-face meetings necessary, working at different times, the use of information and communication technology and the diversity of the workforce⁵⁶.

2.2.2 Categorizing virtual teams through the dimensions of virtual work

Identification of the different types of virtual teams is important, because each of them have special characteristics that require nuances of behavior to be effective⁵⁷. Although virtual teams can undertake almost any kind of assignment, team leaders and members need to have a solid understanding of the type of virtual team they work in and the special challenges each type presents⁵⁸. There are several ways to categorize different types of virtual teams. Duarte & Snyder⁵⁹ divide virtual teams into categories by their purpose while researchers such as Vartiainen, Kokko & Hakonen⁶⁰, Fisher & Fisher⁶¹, and Järvenpää & Leidner⁶² describe the varieties through the dimensions of virtual work. The categorization of virtual teams is discussed here through the four dimensions of virtual work invented by Vartiainen, Kokko & Hakonen.

With combinations of the four dimensions described above it is possible to illustrate a great amount of different practical forms of organisation⁶³. For the sake of simplicity, forms of organization varying in relation to the dimensions of place, time and diversity are presented in this study.

If assumed that each of the three dimensions have only their extremities and the intermediate forms are not taken into account, eight different types of teams can be

⁵⁴ Vartiainen, Kokko & Hakonen 2004a, 21–22.

⁵⁵ DeSanctis, Staudenmayer & Wong 1999.

⁵⁶ Vartiainen, Kokko & Hakonen 2004a, 20.

⁵⁷ Lipnack & Stamps 2000, 62.

⁵⁸ Duarte & Snyder 1999, 5.

⁵⁹ Duarte & Snyder 1999, 6.

⁶⁰ Vartiainen, Kokko & Hakonen 2004a, 21–22.

⁶¹ Fisher & Fisher 2001, 47–48.

⁶² Järvenpää & Leidner 1998.

⁶³ Vartiainen, Kokko & Hakonen 2004a, 21–22.

illustrated as in the Figure 5. Two types of teams, however, are not of interest from the viewpoint of virtuality. The first one is the team of similar people working in the same place and at the same time, and the second one is the team of dissimilar people working in the same place and at the same time. By eliminating these two teams the six types of virtual teams, varying by the three dimensions, can be demonstrated.⁶⁴ The Table 1 gives an example of each of the six kinds of virtual teams⁶⁵.

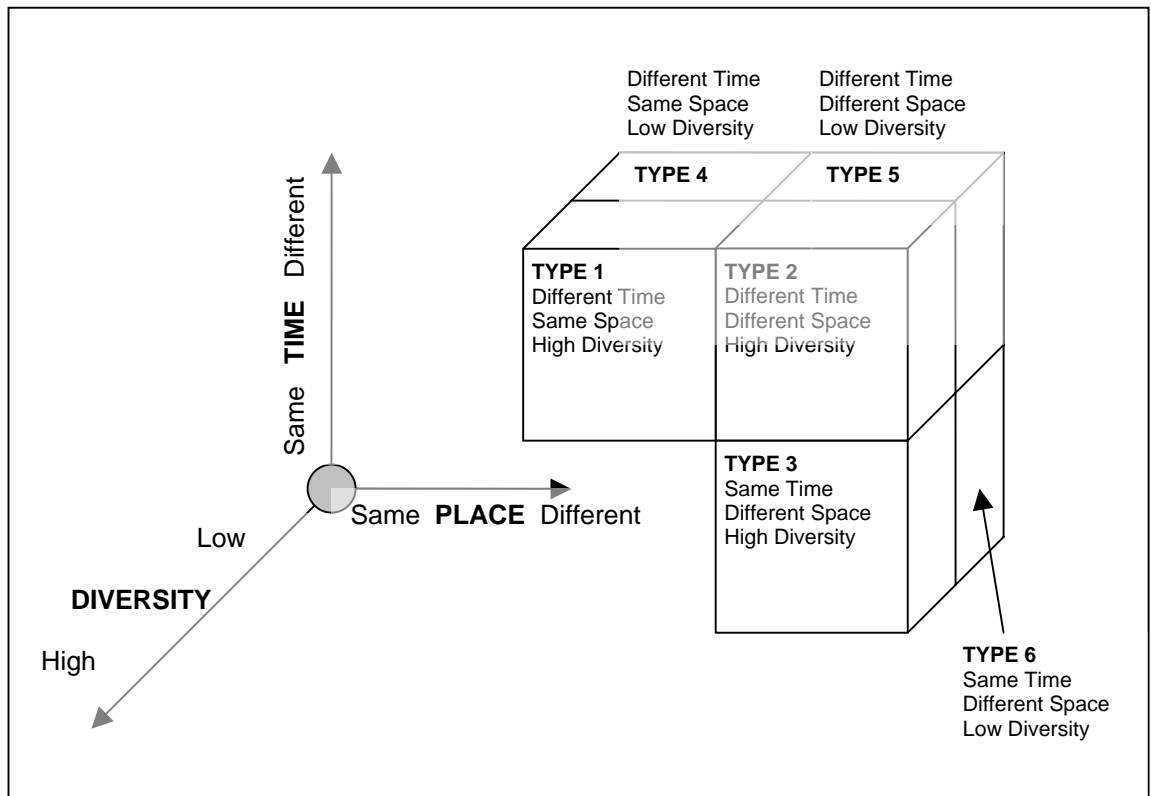


Figure 5. Six types of virtual teams.⁶⁶

⁶⁴ Fisher & Fisher 2001, 44; Vartiainen, Kokko & Hakonen 2004a, 68–70.

⁶⁵ Vartiainen, Kokko & Hakonen 2004a, 69.

⁶⁶ Fisher & Fisher 2001, 46.

Table 1. Different kinds of virtual teams as combinations of the dimensions place, time and culture.⁶⁷

Place	Time	Diversity	Example group
same	same	low	I Local assemblage group consisting of women only
same	same	high	II Local assemblage group consisting of women, men, immigrants and Finns
same	different	high	III Multicultural service team working in two shifts in a department store
same	different	low	IV Finnish service team working in two shifts in a department store
different	different	high	V Multicultural R&D working group working sequentially in different places around the globe
different	different	low	VI Finnish development group of a global company working in different places
different	same	high	VII Global and multicultural marketing group working simultaneously with one marketing plan
different	same	low	VIII Global Finnish marketing group working simultaneously with one marketing plan

In general, virtual teams vary considerably in their composition of members. Usually, the majority of the team is working together in the same location and only some persons are working dispersed. The core and peripheral members of the virtual team may require different levels of interaction with each other and the team leader.⁶⁸

⁶⁷ Vartiainen, Kokko & Hakonen 2004a, 69.

⁶⁸ Clutterbuck 2004, 25.

3 CHALLENGES IN VIRTUAL TEAMS

To make the best use of virtual teams, the challenges in virtual teams must be identified and understood⁶⁹. While many challenges associated with virtual teams are similar to those of conventional teams, the difficulties are made more complicated by time, distance⁷⁰, diversity of employees, and mediated communication⁷¹. This chapter is the second part of the theoretical framework of the study. It discusses the specific challenges of virtual teams identified by the literature. The challenges are categorized according to the dimensions of virtual work invented by Vartiainen, Kokko & Hakonen⁷².

According to researches, virtual teamwork is not functioning very well in most cases. Conventional ways of working are deep-seated and people are willing to continue doing what they have been doing for a long time. When problems appear, the most ordinary and secure solution is to let the separate units work as earlier – alone and independently.⁷³ For the most part, virtual teams are thrown together, in an ad hoc fashion, often without a clear idea of how they might function effectively or how the surrounding organizations can effectively support them. The organizational policies considering conventional as well as virtual teams are really appropriate for traditional organizations only.⁷⁴ This is one of the main reasons why virtual teams fail⁷⁵. People overlook the implications and do not make accommodations for how different it really is when they and their colleagues no longer work face-to-face⁷⁶.

The leadership and management issues are central in the survival and success of virtual teams⁷⁷. In many ways, leading a virtual team is much more demanding than leading a conventional team. It is not easy to identify problems, monitor what people are doing or

⁶⁹ E.g. Pauleen 2004, ix; Vartiainen, Kokko & Hakonen 2004a; Lipnack & Stamps 2000.

⁷⁰ Kerber & Buono 2004, 4–5; Vartiainen, Kokko & Hakonen 2004a.

⁷¹ Vartiainen, Kokko & Hakonen 2004a.

⁷² Vartiainen, Kokko & Hakonen 2004a, 22.

⁷³ Vartiainen, Kokko & Hakonen 2004a, 18.

⁷⁴ Pauleen 2004, ix.

⁷⁵ Lipnack & Stamps 2000, 19.

⁷⁶ Kokko, Hakonen & Kuokkanen 2004, 2.

⁷⁷ E.g. Vartiainen, Kokko & Hakonen 2004a; Lipnack & Stamps 2000.

expect when they report in.⁷⁸ In addition, the traditional management and leadership means, such as creating trust and commonalities, are challenged in the context of virtual teams because developing those features without physical presence necessitates new kind of people management skills⁷⁹. Typically, the importance of leadership and management in virtual teams is misunderstood⁸⁰.

3.1 Place

An organization dispersed by place means that its members are working in different rooms or floors of the same building, in different buildings or locations or in totally different countries. The most common case is where the first part of the team is dispersed and the other works closely spaced. There are two characteristics regarding the working place. The first is the proximity of the teams or members within one team, and the other is the degree of mobility. Both of these characteristics have an impact on how people communicate with each other.⁸¹

3.1.1 Proximity

How far away from each other do people have to be before they need to worry about compensating for distance? Or to put it another way, how close do they have to be to get the advantage of being in the same place?

In the late 1970's, Thomas Allen⁸² of MIT's media laboratory, published the results of a study he had conducted to determine the relationship between the frequency of communication between co-workers and their separation distance⁸³. He found that once people got more than ten meters apart, the likelihood of their communication at least once a week dropped below 5 %⁸⁴. When the proximity increased from 30 meters to

⁷⁸ Clutterbuck 2004, 27.

⁷⁹ Eriksson & Mäkinen 2004, 13.

⁸⁰ Kokko, Hakonen & Kuokkanen 2004, 2.

⁸¹ Vartiainen, Kokko & Hakonen 2004a, 38.

⁸² Allen 1977.

⁸³ In Haywood 1998, 14.

⁸⁴ Haywood 1998, 14.

3000 kilometers, there were not significant differences in the degree of communication (see the Figure 6)⁸⁵.

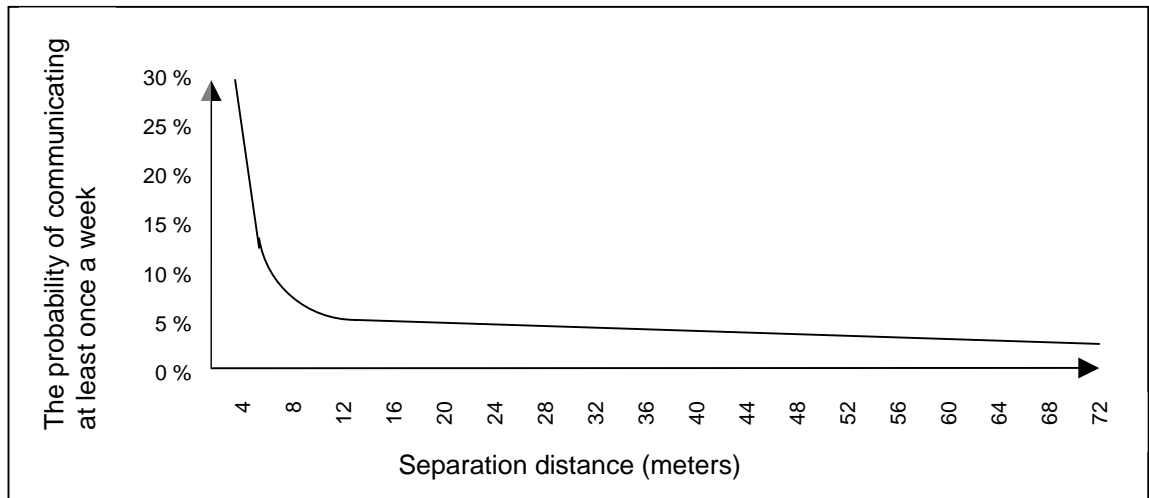


Figure 6. The probability of communicating at least once a week versus separation distance.⁸⁶

Haywood's⁸⁷ survey showed that in the late 1990's high technology project managers were significantly changing the standard. More than eighty percent of these managers reported that they communicated with virtual team members at least once a week. Communication patterns between individual team members, however, more closely resembled the results of Thomas Allen's study⁸⁸. Project managers are "the early adopters" of the new communication styles because they are the ones saddled with the responsibility for making things work⁸⁹.

Communicating seems to be greatly affected by the proximity of coworkers⁹⁰. This speaks on behalf of working in the same place when lively communication within the team is needed. However, this kind of situation may be created with the support of information and communication technology as well.⁹¹

⁸⁵ Vartiainen, Kokko & Hakonen 2004a, 39.

⁸⁶ Haywood 1998, 14.

⁸⁷ Haywood 1998, 14.

⁸⁸ It is interesting to notice that communication patterns between virtual team members have been at the same level from year to year although information and communication technology has developed remarkably.

⁸⁹ Haywood 1998, 14.

⁹⁰ Vartiainen, Kokko & Hakonen 2004a, 38; Haywood 1998, 14.

⁹¹ Vartiainen, Kokko & Hakonen 2004a, 38.

3.1.2 Mobile telework

Mobile teleworkers make use of new information and communication technology by either increasing their locational flexibility or enhancing their productivity. Locational flexibility means that mobile workers can work in different places and, by implication, at different times. Enhancing productivity is, for instance, accessing corporate data during stays in the field to improve services to customers. What distinguishes mobile workers from traditional field workers, e.g. sales representatives, is the use of online connections while traveling. Online connections, especially e-mail, allow distant workers to continue cooperating with both employees at the central site and external business partners and also remain integrated in the production process.⁹²

Mobile solutions are not necessarily genuinely in use in many companies. Many have not wanted to invest in the technologies, fearing among other things the costs and insufficient functioning. Also, many find the use of technologies to be troublesome. This inconvenience is due to shortages in the infrastructure, inconveniences in the user interfaces, limited experience of use and weak managerial practices. It is assumed that new mobile technologies and services will be implemented more in the future, thus creating both pressures to develop and possibilities to work flexibly in different places and over time. Whether this development is a nuisance or a blessing for employees is a dilemma and a question of choices and decisions between alternatives.⁹³ The direction the development is heading is, however, not clearly presented⁹⁴.

From the perspective of the organization, mobility of the members can increase the spreading of knowledge and skills between units and locations. It is easy for mobile teleworkers to create a holistic view on the businesses and organizations as a whole. In spite of that, shallowness and the lack of commitment to the locational knowledge can be seen as a disadvantage. In such a constantly changing work environment creating social relations with each other is seen as difficult. From an employee, the mobile

⁹² ECaTT 2000, 10.

⁹³ Vartiainen, Kokko & Hakonen 2004b, 1–2.

⁹⁴ Vartiainen, Lönnblad, Balk & Jalonen 2005, 6.

telework demands willingness as well as flexibility. When comparing mobile work to the dimensions of virtual work, it can be seen that mobile work is very virtual.⁹⁵

3.1.3 Social wellbeing

When working face-to-face, people are aware not only of the tasks and the working situation but other members of the team as well. Interaction caused by the common work place makes it possible to share real time knowledge on the activities of others, such as their locations and intentions. This awareness helps the team act effectively.⁹⁶ In a virtual work environment, people do not routinely see one another since they are in different places, spread out around the world. They miss out on the social chitchat that occurs, for instance, around the kitchen and hallway.⁹⁷ From the viewpoint of individual, the challenges of virtual teamwork are the two following things especially: how to create similar awareness and feeling of presence with others as in conventional teamwork⁹⁸.

The lack of togetherness affects, for instance, the morale, commitment and communication of the employees. Creating and maintaining a feeling of togetherness is thus one of the main challenges in virtual teams.⁹⁹ Virtual teams vary considerably in their composition of members. Usually, there are core and peripheral members of the virtual team who require different levels of interaction with each other and the team leader.¹⁰⁰ Virtual employees, especially the peripheral ones, often have a feeling of isolation¹⁰¹.

The main conclusion in the earlier research on the social effects of virtual communication has been that the lack of non-verbal cues has negative effects on the relationships¹⁰². However, *the social information processing theory*¹⁰³ argues that

⁹⁵ Vartiainen, Kokko & Hakonen 2004a, 39–41.

⁹⁶ Vartiainen, Kokko & Hakonen 2004a, 42.

⁹⁷ Clutterbuck 2004, 27.

⁹⁸ Vartiainen, Kokko & Hakonen 2004a, 42.

⁹⁹ Connaughton & Daly 2004, 119.

¹⁰⁰ Clutterbuck 2004, 25.

¹⁰¹ Connaughton & Daly 2004, 119.

¹⁰² Blomqvist & Henttonen 2004, 3.

¹⁰³ Walther 1996.

virtual teams can share relational information¹⁰⁴. According to this theory, social relationships just take a longer time to develop in virtual groups where the transfer rate is slower. Thus, mediated communication does not limit group interaction, as initially expected, and the group is able to overcome the limitations when given enough time.¹⁰⁵

3.1.4 Trust

Building and maintaining trust in a virtual environment are the most critical challenges in virtual teamwork¹⁰⁶. The atmosphere of trust in a virtual team enhances open communication, improves cooperation, decreases unawareness, creates collective understanding and improves costs controlling¹⁰⁷. Hence, trust creates a feeling of psychological security¹⁰⁸.

It has been argued that the lack of social context in virtual teams may make it more difficult to develop trust between the team members. Kimble & Barlow¹⁰⁹ demonstrate this with the reluctance of the virtual team members to share their work-in-progress with the other virtual team members. This may indicate lack of trust in the virtual team, but it may also hint that in order to work successfully in a virtual team one must change one's approach towards work.¹¹⁰ Misunderstandings arising from the lack of trust can cause conflicts¹¹¹.

An effective virtual team leader invests time and effort in keeping contact, ensuring that at least some of the communication is relationship building rather than just transactional. It is useful to ensure that members get to know each other on a level well below the surface. Virtual team leader is the one who has to pay attention to trust building in every stage of a developing virtual team.¹¹² Being honest and keeping promises helps model the way for others. Trust-building also includes activities

¹⁰⁴ In Blomqvist & Henttonen 2004, 3.

¹⁰⁵ Blomqvist & Henttonen 2004, 3.

¹⁰⁶ Fisher & Fisher 2001, 96.

¹⁰⁷ Fernandez 2004, 50.

¹⁰⁸ Vartiainen, Kokko & Hakonen 2004a, 135.

¹⁰⁹ Kimble, Li & Barlow 2000.

¹¹⁰ Kimble, Li & Barlow 2000.

¹¹¹ E.g. Clutterbuck 2004, 26.

¹¹² Clutterbuck 2004, 27.

establishing strong business ethics within the team, ensuring that one's interactions with the team are consistent and predictable, thoughtfully setting the initial tone for interaction within the team, being responsive to team member requests or inquiries, monitoring language and terminology, maintaining confidences and creating opportunities for social interaction among virtual team members.¹¹³

3.2 Time

Time as a dimension of virtual work can be divided into two sub-dimensions. Firstly, it is a question of whether work happens synchronously or asynchronously¹¹⁴ in different time zones or sequentially in the same time zone. Secondly, is the social structure and the collaboration of actors permanent or temporary?¹¹⁵

3.2.1 Time zones

Time zones challenge virtual teamwork. Time becomes a problem when people who are not in the same place need some of their activities to be in sync. Globally, the farther apart people are physically, the more time zones they must cross to communicate.¹¹⁶ It is observed that simultaneous work crossing more than six time zones causes remarkable problems. For instance, organizing mutual meetings through communication medias becomes particularly challenging. In extreme cases, some members of a virtual team may have to participate in the meeting at nighttime when a contact across three time zones needs to be reached immediately.¹¹⁷ For instance, there is no rational time framework for a virtual team spreading from United States to Europe to Asia¹¹⁸. Nevertheless, virtual employees often have to flex with their business hours in order to communicate and collaborate across time zones¹¹⁹.

¹¹³ Fisher & Fisher 2001, 96.

¹¹⁴ Synchronous and asynchronous communication is discussed in the sub-chapter 3.4.1.

¹¹⁵ Vartiainen, Kokko & Hakonen 2004a, 45.

¹¹⁶ Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

¹¹⁷ Riopelle, Gluesing, Alcorido, Baba, Britt, McKether, Monplaisir, Horn Ratner & Harris Wagner 2003, 263.

¹¹⁸ Lipnack & Stamps 2000, 224.

¹¹⁹ Riopelle, Gluesing, Alcorido, Baba, Britt, McKether, Monplaisir, Horn Ratner & Harris Wagner 2003, 263.

Working in different time zones is usually seen as a complicating issue only, but sometimes it can actually benefit teamwork. For instance, in R&D working groups it may be possible to circulate tasks from time zone to another and thus achieve a “working day of 24 hours”. People have also criticized this kind of circulating. If communication between different places lags, a working day of 24 hours may turn into three eight hour periods consisting of wondering and fixing things and reinventing the wheel.¹²⁰

Although time differences are troublesome on virtual teams, they can still be easily managed¹²¹. When even apparently conventional teams cross time boundaries, people get used to time differences. They have to learn to think virtually.¹²²

3.2.2 Temporariness

Virtual teams are often temporary project teams. Fixed-term nature brings additional demands on work. After achieving an assignment the project breaks up and new one begins. Generally the projects consist of different employees than the previous ones, and due to this kind of variety, temporary work may be more interesting to the employee. On the other hand, this way team spirit does not develop, and individuals do not commit to the group. Individuals do not bother to invest energy in getting to know the other team members when it is known that their cooperation will not last for long. Communities that are always working together benefit from the good community spirit, but in contrast they suffer from the blinding group thinking and boring routines.¹²³

Furthermore, a virtual team member is often participating in many projects simultaneously. According to Markus¹²⁴, managing membership in multiple teams is one of the core challenges of virtual teamwork. For instance, scheduling meetings is

¹²⁰ Vartiainen, Kokko & Hakonen 2004a, 45.

¹²¹ Vinaja 2003, 341.

¹²² Lipnack & Stamps 2000, 20.

¹²³ Vartiainen, Kokko & Hakonen 2004a, 45.

¹²⁴ Markus 2004, 69.

difficult and increases the use of multiple work practices and tools, possibly resulting in overall inefficiency and members falling out of the loop.¹²⁵

3.3 Diversity

The more decentralized an organization is, the more probable it is that its members have different backgrounds. Members bring the culture of their own organizations to the team, and this complicates cooperation. The members of a global team speak different languages as their mother tongues and they have different pasts, values, beliefs and norms. In addition, they differ from each other in age, gender, education and experience. All of these factors have an impact especially on communication and the understanding of contents.¹²⁶ When teams turn global, their language and culture issues clearly loom larger. However, all teams of the future will have to cope with increasing diversity in the workplace. Not only is the workforce becoming more diverse, but the task requirements of complex work demand that more diverse people work together, whether in traditional settings or in virtual teams.¹²⁷ Organizations need to design structures to make optimal use of the talents of a diverse workforce and to develop cultural values that encourage people to work together. An organization's structure and culture determine how effectively the managers are able to coordinate and motivate the workers.¹²⁸ Cultural differences and language barriers, being the most challenging issues arising from diversity in virtual teams, are the only topics discussed in this sub-chapter. The innovativeness and creativeness, originating from the different views of diverse members of virtual teams, are studied subsequently.

3.3.1 Cultural differences

Geert Hofstede¹²⁹ conducted a study of how culture relates to values in the workplace. As a part of his job as a psychologist working for IBM, Hofstede collected data on

¹²⁵ Markus 2004, 69.

¹²⁶ Vartiainen, Kokko & Hakonen 2004a, 46.

¹²⁷ Lipnack & Stamps 2000, 66.

¹²⁸ Jones 2001, 12.

¹²⁹ Hofstede 1983.

employee attitudes and values from more than 100,000 individuals from 1967 to 1973. This data enabled him to compare dimensions of culture across 40 countries. Hofstede isolated four dimensions he claimed summarized different cultures:

- Power distance
- Uncertainty avoidance
- Individualism versus collectivism
- Masculinity versus femininity¹³⁰

Power distance dimension focused on how a society deals with the fact that people are unequal in physical and intellectual capabilities. According to Hofstede, high power distance cultures were found in countries that let inequalities grow over time into inequalities of power and wealth. Low power distance cultures were found in societies that tried to play down such inequalities as much as possible. The *individualism versus collectivism* dimension focused on the relationship between the individual and his or her fellows. In individualistic societies, the ties between individuals were loose and individual achievement and freedom were highly valued. In societies where collectivism was emphasized, the ties between individuals were tight. In such societies, people were born into collectives, such as extended families, and everyone was supposed to look after the interest of his or her collective. *Uncertainty avoidance* dimension measured the extent to which different cultures socialized their members into accepting ambiguous situations and tolerating uncertainty. Members of high uncertainty avoidance cultures placed premium importance on job security, career patterns, retirement benefits, and so on. They also had a strong need for rules and regulations; the manager was expected to issue clear instructions, and subordinates' initiatives were tightly controlled. Lower uncertainty avoidance cultures were characterized by a greater readiness to take risks and less emotional resistance to change. *Masculinity versus femininity* dimension looked at the relationship between gender and work roles. In masculine cultures, sex roles were sharply differentiated and traditional "masculine values," such as achievement and the effective exercise of power, determined cultural ideals. In feminine cultures, sex roles were less sharply distinguished, and little differentiation was made between men and

¹³⁰ Hofstede 1983.

women in the same job.¹³¹ Later Hofstede added a fifth dimension of culture, long-term versus short-term orientation¹³².

Hofstede's results also pointed out significant differences between cultures. Many of the findings are consistent with standard Western stereotypes about cultural differences. For example, many people believe Americans are more individualistic and egalitarian than Japanese (they have a lower power distance), who in turn are more individualistic and egalitarian than Mexicans. Similarly, many might agree that Latin countries, such as Mexico, place a higher emphasis on masculine value – they are machismo cultures – than the Nordic countries.¹³³

Other researchers have also made categorizations for cultural differences. For instance, Hall & Hall¹³⁴ classified groups as monochronic or polychronic, high or low context, and past- or future-orientated¹³⁵. Trompenaars'¹³⁶ dimensions were different still: universalistic versus particularistic, individualist versus collectivist, specific versus diffuse, achievement- versus ascription-oriented and neutral versus emotional versus emotional or affective¹³⁷.

The need for a convincing categorization is obvious. It enables us to (1) predict behavior, (2) clarify why people do what they do, (3) avoid being offensive, (4) search for some kind of utility, (5) standardize policies, and (6) perceive neatness and order.¹³⁸

3.3.2 Virtual teams as mixtures of cultures

Cultural differences have a major impact on working¹³⁹. In virtual teams, each member brings his or her own culture to a shared arena. Working in a cross-cultural team may be

¹³¹ Hofstede 1983.

¹³² Lewis 2002, 69.

¹³³ Hill 2003, 110.

¹³⁴ Hall & Hall 1990.

¹³⁵ In Lewis 2002, 69.

¹³⁶ Trompenaars 1993.

¹³⁷ In Lewis 2002, 69.

¹³⁸ Lewis 2002, 69.

¹³⁹ E.g. Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

interesting and innovating but many problems arise as well.¹⁴⁰ Especially in the beginning of a project, the team faces many kinds of problems with communicating and collaborating, problems caused partly by inexperience and often differences in opinions of diverse virtual team members. People from different cultures may tend to misunderstand each other's behavior or stereotype people from other countries and hence come to distrust one another.¹⁴¹ In extreme cases, the virtual team may suffer from cultural collisions¹⁴².

Virtual teams must recognize the differences between cultures in order to work efficiently. Working in a cross-cultural virtual team can create awareness concerning the principal cultural differences that affect communication and working situations, and it can provide techniques for lessening culturally based problems.¹⁴³ Awareness of the cultural differences in a virtual team is vital if communication is to be clear, honest and properly directed¹⁴⁴. Furthermore, knowing the characteristics of one's own culture is important because all people observe and interpret things from the viewpoint of their own culture¹⁴⁵.

Cultural issues are often problematic in the developing stage of the virtual team only. The lifecycle of a diverse virtual team as a conventional team consists of dysfunction, conflicts, learning and advancements.¹⁴⁶ When the team develops, however, a unique team culture evolves as a mixture of all the different team members' national, organizational and functional cultures¹⁴⁷. Advances in technologies have increased each person's ability and likelihood of interacting with people of cultural backgrounds quite different from their own¹⁴⁸. In addition, people with good knowledge of other cultures are more eager to explore cultural issues. This might indicate that people who are more culturally experienced try to find and reveal individuating information. People less culturally experienced might not do this.¹⁴⁹

¹⁴⁰ E.g. Lipnack & Stamps 2000, 66; Vartiainen, Kokko & Hakonen 2004a, 46.

¹⁴¹ E.g. Lewis 1996.

¹⁴² E.g. Lipnack & Stamps 2000, 66; Vartiainen, Kokko & Hakonen 2004a, 46.

¹⁴³ Vinaja 2003, 342.

¹⁴⁴ E.g. Sookman 2004, 91; Lewis 1996.

¹⁴⁵ E.g. Lewis 1996.

¹⁴⁶ Vartiainen, Kokko & Hakonen 2004a, 46; 72–73.

¹⁴⁷ Duarte 1999, 55.

¹⁴⁸ Vinaja 2003, 342.

¹⁴⁹ Järvenpää & Leidner 1998.

3.3.3 Language barriers

In order to communicate, a virtual team has to agree upon a common language. Generally, at least some of the individuals have to work using a foreign language. The major languages used in businesses today are English, Spanish, Japanese and Chinese.¹⁵⁰ It is natural that individuals speaking different languages as their mother tongues face difficulties when communicating. An individual using foreign language for working may communicate slowly and sometimes imperfectly as well. Thus misunderstandings in multi-lingual teams are ordinary. The receiver may misunderstand a message to be rude or even offensive.¹⁵¹

Furthermore, language does far more than just enables people to communicate with each other. The nature of one's language also structures the way one perceives the world. The language of a society can direct the attention of its members to certain features of the work rather than others. In countries where many languages are spoken, many cultures have often prevailed as well. Since language is a tool for thinking, most people prefer to work with their own language and this may affect the quality of virtual teamwork.¹⁵²

Language barriers, as well as cultural collisions, are faced mostly in the beginning of virtual teamwork. Teams are internationalizing to a greater extent, and the members just have to adapt to the situation where coworkers are representing different cultural and lingual backgrounds. On the other hand, the tasks of virtual teams are constantly becoming more difficult, thus demanding better language skills from the members. The language differences that virtual teams have to contend with are not all born of different native tongues. Two people with different professional upbringings can have almost as much difficulties communicating as two people who have grown up speaking English

¹⁵⁰ Vinaja 2003, 342.

¹⁵¹ Riopelle, Gluesing, Alcordo, Baba, Britt, McKether, Monplaisir, Horn Ratner & Harris Wagner 2003, 246.

¹⁵² Hill 2003, 104.

and Japanese.¹⁵³ One way for avoiding language problems is to select members skilled in the language used in the team¹⁵⁴.

3.3.4 Creativeness and innovativeness

The major part of knowledge sharing and innovating in an organization occurs when employees are working collectively¹⁵⁵. A benefit of the diversity of virtual team members is the growth in creativeness and innovativeness, which consequences from different viewpoints of the members. On the other hand, a common way of working may not be easy to establish and there may also be difficulties with problem solving.¹⁵⁶

O’Conner and Wulf¹⁵⁷ propose that a cross-functional team is the appropriate way to quickly design and implement the new solution. Sometimes close cooperation of different functional groups can add value in a way one function cannot. Virtual team is a way to combine cross-functional expertise when working for the same purposes.¹⁵⁸

3.4 Mode of interaction

The mode of interaction – the density, content and means of both face-to-face and mediated communication – is often regarded as the central factor of dispersed work. The complexity of shared tasks has an effect on both the amount of interaction and the versatility of tools needed. A one-way message is sufficient for familiar routines, but complex assignments demand versatile communication.¹⁵⁹

¹⁵³ Lipnack & Stamps 2000, 66–67.

¹⁵⁴ Vinaja 2003, 342.

¹⁵⁵ Kettley & Hirsh 2000.

¹⁵⁶ Vartiainen, Kokko & Hakonen 2004a, 46.

¹⁵⁷ O’Connor & Wulf 2004, 32–33.

¹⁵⁸ Lipnack & Stamps 2004, 64.

¹⁵⁹ Vartiainen, Kokko & Hakonen 2004a, 47.

3.4.1 Working synchronously and asynchronously

Virtual communication can be divided into synchronous and asynchronous communication. Face-to-face meetings, phone calls and videoconferences are examples of synchronous communication.¹⁶⁰ All the parties involved are engaged in the communication simultaneously. According to Haywood's¹⁶¹ definition, this is when communication is taking place in the same "time space". As an alternative, asynchronous communication has a significant delay between the point of time the sender transmits a message and the time the receiver receives it (see the Figure 7). Asynchronous communication include, for instance, e-mail, voice mail and fax. Virtual teams use both ways for collaborating.¹⁶²

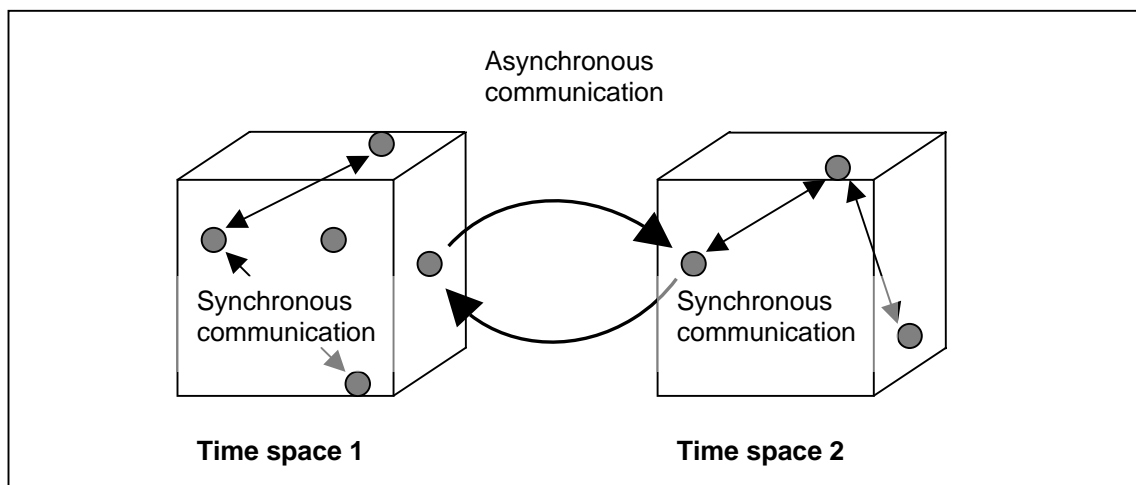


Figure 7. Synchronous and asynchronous communication.¹⁶³

Research supports the notion that synchronous communication tends to build relationship and trust more quickly than asynchronous communication. It is certainly possible to establish relationships based strictly on asynchronous communication, it just takes longer.¹⁶⁴ The benefit of asynchronous communication is that one can form and structure one's message carefully. When using the synchronous communication medias, responses are expected immediately, and thus the answerer may have to settle for an

¹⁶⁰ Haywood 1998, 26.

¹⁶¹ Haywood 1998, 26.

¹⁶² Haywood 1998, 26.

¹⁶³ Haywood 1998, 26.

¹⁶⁴ Haywood 1998, 26.

insufficient reply. It is hard to compare the superiority of different modes of interaction. Synchronous and asynchronous modes and medias of interaction are not necessarily substitutes for each other. Particular communication medias fit for particular situations and therefore many means of interaction are used for doing similar tasks in virtual teams.¹⁶⁵

The following table lists examples of the channels of communication in virtual teams and orders them into four categories by the dimensions of time (synchronous versus asynchronous) and place (same place versus different place) (see the Table 2).¹⁶⁶

*Table 2. Modes and means of interaction in virtual teams.*¹⁶⁷

	Same place	Different place
Synchronous	<ul style="list-style-type: none"> • Face-to-face meetings • Electronic whiteboards • Projectors 	<ul style="list-style-type: none"> • Web conferencing • Video conferencing • Teleconferencing • Distance learning (eLearning) • Help desks • Instant Messaging • Electronic whiteboards • Projectors • Cameras • Telephones
Asynchronous	<ul style="list-style-type: none"> • Team rooms • Electronic mail 	<ul style="list-style-type: none"> • E-mail • Collaborative software • Group time management • Distance learning • Web conferencing • Voice mail

3.4.2 Selecting the modes of interaction

Most of the communication in virtual teams can be supported by standard technologies. However, providing proper support for particular use is rather demanding. The reason for this is that new technologies and services are launched all the time and the expectations for them are high. Selecting the right technologies and services is not

¹⁶⁵ Lipnack & Stamps 2000, 208–209.

¹⁶⁶ Gould 2000, <<http://www.seanet.com/~daveg/vrteams.htm>>. Applications are listed in normal text and major products or product groupings are listed in italics.

¹⁶⁷ Gould 2000, <<http://www.seanet.com/~daveg/vrteams.htm>>. The author of this study has updated the table. Some terms have also been changed to serve this study better.

altogether easy and upgrading the systems may be costly.¹⁶⁸ For instance, purchasing a videoconference system may be too expensive a solution for a team to collaborate¹⁶⁹. A few theories concerning the selection of communication medias are discussed next.

Choosing the appropriate modes of interaction depends largely on the situation. Lipnack & Stamps¹⁷⁰ divide the modes into the three following groups: face-to-face communication, synchronous mediated communication and asynchronous mediated communication. Face-to-face communication should be used when building trust among virtual team members. Synchronous media is the best option when the team members have to be on the same page although working in different locations. Asynchronous media, instead, creates the ability to link over time and the persisting online meeting place.¹⁷¹

Daft & Lengel¹⁷² suggest teams choose their modes of interaction according to the complexity of the task¹⁷³. Their *Media richness theory* argues that different medias vary in their capacity to carry information. For instance, e-mail allows only few cues to be shared and is thus very constraining, while audio conferencing allows a few more cues (such as tone, pauses and recognition utterances) but constrains referential integrity (such as when the speaker points to what is being talked about for emphasis, prioritization and focus).¹⁷⁴ The following figure (Figure 8) exhibits the field of effective communication by the dimensions of information richness of different medias and task complexity.

¹⁶⁸ Kimble, Li & Barlow 2000.

¹⁶⁹ Lipnack & Stamps 2000, 224.

¹⁷⁰ Lipnack & Stamps 2000, 209.

¹⁷¹ Lipnack & Stamps 2000, 209.

¹⁷² Daft & Lengel 1986.

¹⁷³ In Malhotra & Majchrzak 2005, 11.

¹⁷⁴ Malhotra & Majchrzak 2005, 11.

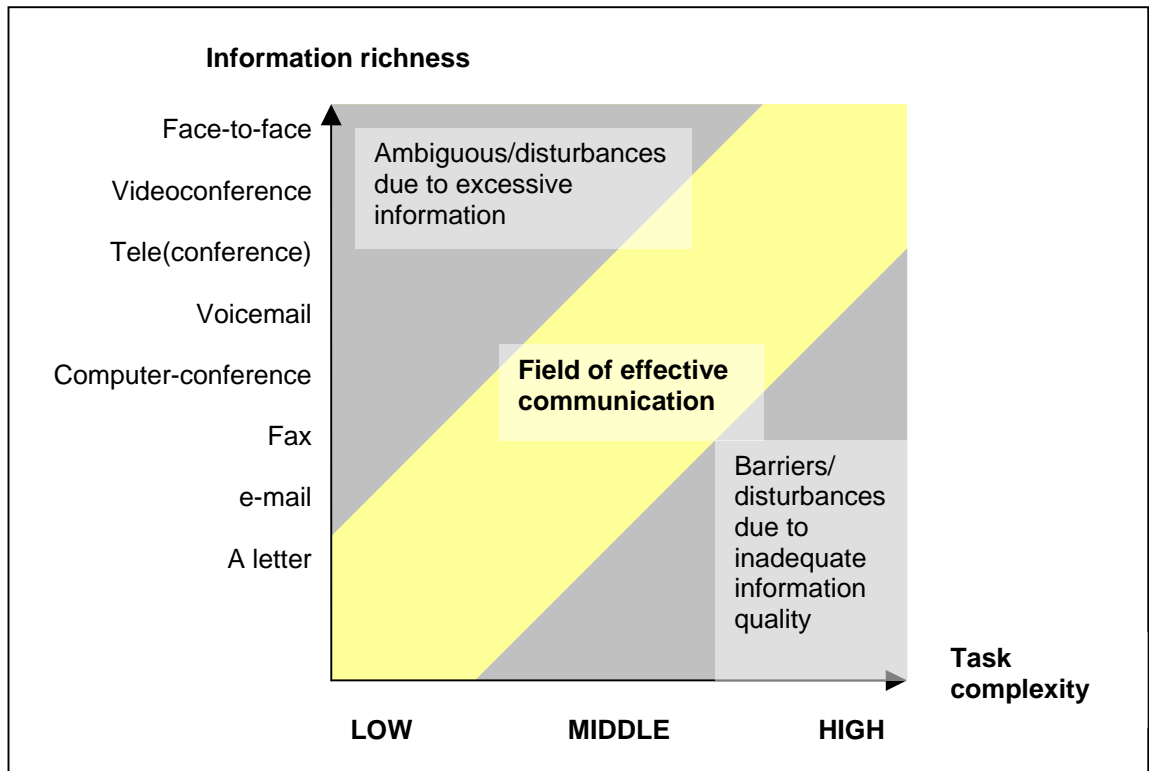


Figure 8. The media richness theory and selection of mode of interaction.¹⁷⁵

Figure 9, as an alternative, shows an adoption of the method of Baltes, Dickson, Sherman, Bauer & LaGanke¹⁷⁶. It displays the relationships of the various collaborative methods, showing each of the methods as points on a canvas defined by the presence of nonverbal cues (x axis) and the degree of synchronization (y axis). Wainfan & Davis¹⁷⁷ have added a box for “Web conference,” by which they mean the kind of meeting in which participants have a shared briefing or some other document, and perhaps a shared whiteboard they discuss in real time with an audio link.

¹⁷⁵ Daft & Lengel 1984 in Vartiainen 2003.

¹⁷⁶ Baltes, Dickson, Sherman, Bauer & LaGanke 2002 in Wainfan & Davis 2004, 5.

¹⁷⁷ Wainfan & Davis 2004, 5.

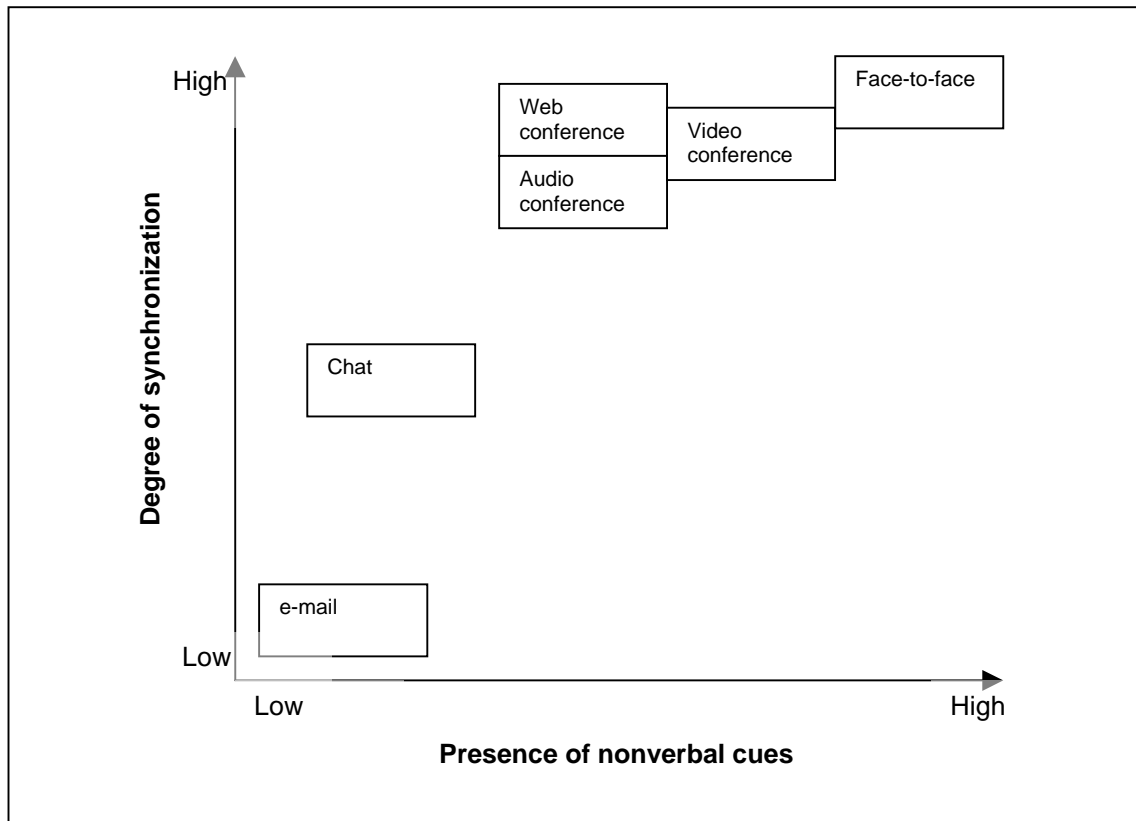


Figure 9. Placement of communication media, by synchronization and cues.¹⁷⁸

The theories mentioned above provide a tool for selecting the appropriate media for each kind of use. Virtual teams, however, inevitably require multiple medias in order to use the right specific medium at the right time although different possibilities for interaction increase the complexity¹⁷⁹. Understanding which combinations of media work best for each type of task or meeting is essential¹⁸⁰. Thus, one of the key challenges of a virtual team leader is to manage the portfolio of different communication technologies¹⁸¹ used for teamwork¹⁸².

3.4.3 Comparing face-to-face communication to mediated communication

Information and communication technologies are means of interaction meant for compensating for the lack of face-to-face communication. However, technologies have

¹⁷⁸ Baltes, Dickson, Sherman, Bauer & LaGanke 2002 in Wainfan & Davis 2004, 5.

¹⁷⁹ Lipnack & Stamps 2000, 224.

¹⁸⁰ Clutterbuck 2004, 27.

¹⁸¹ "Portfolio of communication technologies" term is invented by the author.

¹⁸² Vartiainen, Kokko & Hakonen 2004a, 159.

limits that may result in false interpretations of messages. Complex tasks require the most interaction, which is conventionally achieved best, as can be expected, face-to-face.¹⁸³ Sometimes, however, a virtual team does not have a choice and is forced to communicate electronically while conventional teams can choose whether to communicate face-to-face or use communication medias¹⁸⁴.

The foundation of face-to-face communication is the shared time and place. Speaking face-to-face offers a medium with no appreciable delay between sender and receiver.¹⁸⁵ Furthermore, more senses are utilized in face-to-face communication; the subtleties of a message are better understood when actually seeing and hearing the speaker¹⁸⁶. People communicate a great deal through nonverbal cues. The raising of eyebrows, for example, is a sign of recognition in most cultures, while a smile is a sign of joy.¹⁸⁷ Mediated communication is different when it comes to its ability to transfer social presence and non-verbal cues such as gestures, tones of voice and facial expressions. The amount of non-verbal information lost depends on the technology used. The advantages of face-to-face communication include not only immediacy and spontaneity but also richness and ability to convey a great deal of information. Physical proximity enables both formal and informal communication in a rich way. Informal communication unrelated to work creates a sense of togetherness and solidarity.¹⁸⁸

A problem in interaction mediated through information and communication technology is precisely its inability to support informal, spontaneous communication and cooperation¹⁸⁹.

The members of a dispersed team might occasionally meet face-to-face, but in order to function efficiently, a dispersed team is constantly depended on the help of communication technologies¹⁹⁰. There are a few key times when meeting face-to-face is

¹⁸³ Hinds & Weisband 2003, 30.

¹⁸⁴ Gibson & Cohen 2003, 4–5.

¹⁸⁵ Lipnack & Stamps 2000, 199–200.

¹⁸⁶ Vartiainen, Kokko & Hakonen 2004a, 48.

¹⁸⁷ Hill 2003, 105.

¹⁸⁸ Kayworth & Leidner 2002.

¹⁸⁹ Vartiainen, Kokko & Hakonen 2004a, 48.

¹⁹⁰ Gibson & Cohen 2003, 4–5.

strongly preferred to communicating electronically. According to Munter¹⁹¹, face-to-face meetings are appropriate (1) when the rich nonverbal cues including body, voice and proximity are needed; (2) when the issues are especially sensitive; (3) when the participants do not know one another; (4) when establishing group relationships are crucial; and (5) when the participants can be in the same place at the same time¹⁹². She points out that one of the great advantages in face-to-face meetings is that they are “less technologically complex and therefore their systems are easier to use, less likely to crash, and less likely to have compatibility problems”¹⁹³. On the other hand, real-time oral communication has little inherent storage, recall, modification, or reprocessing capability¹⁹⁴.

Although generally considered inferior to face-to-face communication, there are notable positive sides on virtual communication as well. Virtual interaction may be more democratic, because the prejudices and power structures between the participants cannot be seen directly. It may be easier to focus on the matter at hand when people do not need to pay attention to differences in the formal status of the participants. Moreover, technology is developing fast, as are the various communication means. These factors combined will increase the speed, richness and amount of information mediated in the future, even if communication was limited to the use of electric information and communication technology alone. Versatile and efficient technology enables believable virtual presence and awareness of others for people working dispersed.¹⁹⁵ It depends on the technology used how much non-verbal information will be lost¹⁹⁶. Furthermore, it is argued that technology will entirely replace the need for individuals meeting face-to-face in the near future¹⁹⁷.

¹⁹¹ Munter 1998.

¹⁹² In Fisher & Fisher 2001, 120.

¹⁹³ Fisher & Fisher 2001, 120.

¹⁹⁴ Lipnack & Stamps 2000, 200.

¹⁹⁵ Vartiainen, Kokko & Hakonen 2004a, 49.

¹⁹⁶ Kayworth & Leidner 2002.

¹⁹⁷ Fisher & Fisher 2001, 123.

3.4.4 Technological challenges

Technical problems concerning virtual teamwork are numerous. These problems range from unreliable systems and incompatible networks to computers that are not powerful enough and to virtual traffic-jams during certain times of the day. The traffic-jams cause frustration and often delays. From a technical point of view, real-time multimedia communications including voice, data, text video and the use of a shared whiteboard, are essential when working in a virtual team. However, the infrastructure to support these technologies is not always available and creating it would increase costs to the organization.¹⁹⁸ In some cases, employees working in peripheral areas may not have access to new communications infrastructures¹⁹⁹.

3.4.5 Evolving technology

Technology is evolving and optional communication medias are increasing all the time²⁰⁰. While the amount of communication medias increases, there is change resistance within virtual employees. They may not appreciate having to learn new technologies constantly.²⁰¹ This may result in a situation where those familiar to using new technologies actively take part in virtual teamwork, whereas those experiencing “technophobia” do not²⁰².

These innovations reshape virtual teamwork and leadership. Whether this development is a nuisance or a blessing for employees is a dilemma and a question of choices and decisions between alternatives. According to Vartiainen, Hakonen & Kokko²⁰³, information technology should, of course, be an instrument or medium through which new forms of organizations are enabled but not determined. In contrast, it is the forms and requirements of the task and of the social interaction of the employees collaborating that should shape the actual work process and determine the performance and quality of

¹⁹⁸ Kimble, Li & Barlow 2000.

¹⁹⁹ Vinaja 2003, 341–342.

²⁰⁰ E.g. Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

²⁰¹ Kimble, Li & Barlow 2000.

²⁰² Kayworth & Leidner 2002.

²⁰³ Vartiainen, Kokko & Hakonen 2004b, 1.

the business they are designed for. Consequently, information and communication technologies should meet the work-oriented social requirements in order to be a support rather than a hindrance for work.²⁰⁴

It is assumed that new technologies, mobile technologies and services especially, will be implemented more in the future, thus creating pressures to develop and possibilities to work flexibly in different places and over time²⁰⁵.

3.5 Operational agreement

Literature often recommends a virtual team to have an operational agreement to avoid some pitfalls of virtual work²⁰⁶. Operating norms that are not clearly defined and accepted by a team can lead to conflicts, misunderstandings and, ultimately, reduced productivity. If a team fails to create a reliable operational agreement, the working methods might develop on their own to the wrong direction, which might be problematic.²⁰⁷ A team operating agreement sets the rules of engagement for the way a team works together, and helps a group in trouble because it clearly states what is expected of team members in relation to their own work and their responsibility to the team. This forged consensus eliminates ambiguity and second-guessing, prevents people from stepping on the toes of others and lets team members work more effectively. In the end, it solidifies trust and ensures that team members are not only doing what best suits their particular relents but are also taking an active role in team synergy.²⁰⁸

Agreements on protocols may flow proactively from best practices, or they may be put in place reactively when a team's pattern of communication is not working²⁰⁹. Vartiainen, Kokko & Hakonen²¹⁰ advice a virtual team to form a document consisting of a project plan and a team agreement. The natures of these two parts are different to some extent. The project plan defines the vision, mission, strategy, objectives and tasks

²⁰⁴ Vartiainen, Kokko & Hakonen 2004b, 1.

²⁰⁵ Vartiainen, Kokko & Hakonen 2004b, 1.

²⁰⁶ E.g. Vartiainen, Kokko & Hakonen 2004a, 77–80; Sookman 2004, 91; Lipnack & Stamps 2000, 224.

²⁰⁷ E.g. Vartiainen, Kokko & Hakonen 2004a, 77–80; Sookman 2004, 91.

²⁰⁸ Sookman 2004, 91.

²⁰⁹ Lipnack & Stamps 2000, 224.

²¹⁰ Vartiainen, Kokko & Hakonen 2004a, 77–80.

of the team. It is also used as a tool for communication and steering. It consists of the stages of the project, an estimated timetable, distribution of work and budgeting. Following these is a crucial part of project management. The team agreement consists of the values, norms and team principles to be complied in the team or project.²¹¹ Sookman²¹² proposes, in her part, that an operational agreement might include procedure of communication patterns, acceptable meeting protocols and decision-making protocols.

However, one operational agreement does not fit all. To increase the likelihood of success, the operational agreement should response to the actual needs of the virtual team in question.²¹³ In addition, the operational agreement should be established by all of the members of the virtual team and approved by the management. This is to secure that all members of the team are conscious of the project goals and schedules.²¹⁴ Vartiainen, Kokko & Hakonen²¹⁵ recommend the operational agreement to be established in the first mutual meeting. As mentioned earlier, they advise that the first meeting be face-to-face.

3.6 Summary

Chapters 2 and 3 are summarized here. The virtual work environment is discussed first and the challenges in virtual teams are reviewed shortly after that.

As humans moved into the information era, network organization began to form. Companies explored more flexible structures in order to cope with the challenges and demands of the changing business environment. Virtual teams emerged.²¹⁶ A virtual team, like any other team, is a group of people interacting through interdependent tasks guided by a common purpose. Unlike conventional teams, a virtual team works across space, time, cultures and organizational boundaries with links strengthened by webs of

²¹¹ Vartiainen, Kokko & Hakonen 2004a, 77–80.

²¹² Sookman 2004, 91.

²¹³ Sookman 2004, 91.

²¹⁴ Vartiainen, Kokko & Hakonen 2004a, 78.

²¹⁵ Vartiainen, Kokko & Hakonen 2004a, 79.

²¹⁶ Lipnack & Stamps 1999, 14.

communication technologies.²¹⁷ In addition, a virtual team may be a temporary or permanent group of people, the members of which are working in different places by using information and communication technology to achieve common objectives²¹⁸.

To understand virtual work environment better, Vartiainen, Kokko & Hakonen²¹⁹ use the dimensions of place, time, diversity and mode of interaction to create a diagnostic model for virtual work. Each dimension is a separate one in which the level ranges from similar to different as follows (See the Figure 4):

- *Place* (consists of two sub-dimensions):
 - *Location*: actors are working in the same location face-to-face or geographically dispersed in different places.
 - *Mobility*: actors may be physically mobile and change their workplaces or they stay in a fixed place working mainly in one location.
- *Time* (consists of two sub-dimensions):
 - *Time*: actors work either synchronously or asynchronously in different time zones or sequentially in the same time zone.
 - *Temporariness*: the collaboration of actors and their social structure may be permanent or temporary.
- *Diversity*: the background of actors (i.e. their culture, education, sex, nationality, religion, language) is similar or different.
- *Mode of interaction*: communication and collaboration take place directly face-to-face or mediated via different media and technological systems.

In most cases, virtual teamwork is not functioning very well. Conventional ways of working are deep-seated and people are not willing to change their habits.²²⁰ The challenges in developing virtual teams were reviewed in the theoretical part of this study. They were categorized under the dimensions of virtual work as defined by

²¹⁷ Lipnack & Stamps 2000, 18–19.

²¹⁸ Vartiainen, Kokko & Hakonen 2004a, 220.

²¹⁹ Vartiainen, Kokko & Hakonen 2004a, 21.

²²⁰ Vartiainen, Kokko & Hakonen 2004a, 18.

Vartiainen, Kokko & Hakonen²²¹. The following table (Table 3) gathers the challenges most often mentioned in the literature as bullet points.

Table 3. Challenges in developing virtual teams most often mentioned in the literature.

Place	Time
<ul style="list-style-type: none"> • No feel of presence • Loneliness and the sense of isolation • Lack of trust • Inequality between the core team and the members working dispersed • Controlling and giving feedback 	<ul style="list-style-type: none"> • Coordinating cooperation • Virtual conferences taking place late or early in the day • The lack of spontaneous meetings • Tasks may be circulated over time zones • Frequently changing projects and fellow workers • The demands of several overlapping projects
Diversity	Mode of Interaction
<ul style="list-style-type: none"> • Cultural differences • Working using a foreign language • Innovativeness • Different ways of thinking may bear innovativeness 	<ul style="list-style-type: none"> • Mastering various modes of interaction • Choosing a suitable mode of interaction for a specific situation • The constant need of adopting to new technologies • Flood of information • The more difficult the task, the greater the need to meet face-to-face

²²¹ Vartiainen, Kokko & Hakonen 2004a, 21.

4 METHOD OF RESEARCH

This chapter outlines the methodology used in the study. Some methodological underpinnings are presented first, after which the research design is discussed. Subsequently follows the presenting of data collection and data analysis processes used in the empirical study. Lastly, the questions of validity and reliability of the study are put forward.

4.1 Qualitative approach

This study used qualitative methods as the underlying research strategy due to several reasons. As the objective of this study is to describe the challenges in developing virtual teams, the use of qualitative methods focusing on describing, decoding and translating the meaning of certain more or less naturally occurring phenomena in the social work, is justified²²². In qualitative research, the numbers and frequency do not play as important a role as in quantitative research. Instead, qualitative approach is associated with the collection and analysis of written or spoken text or the direct observation of behaviors.²²³ Qualitative approach is suitable when the concentration is on specific situations and action sequences rather than abstractions and general opinions²²⁴. It enables identifying the actual problem areas and provides a holistic view of situations²²⁵. Moreover, since the challenges in developing virtual teams were studied in the context of KONE Corporation, qualitative methods were suitable because the context and the respondent frame of reference seemed to be of importance in this phenomenon.

To finish, the advantages and disadvantages of qualitative approach are discussed. According to King²²⁶, some of the advantages of qualitative approach are:

²²² Cassell and Symon 1994, 3.

²²³ Cassell and Symon 1994, 4.

²²⁴ King 1994, 15.

²²⁵ Cassell and Symon 1994, 5.

²²⁶ King 1994, 33.

- It is a flexible method allowing changes as the research progresses
- It can be used almost anywhere
- It is capable of producing data of great depth
- Most participants readily accept this method

Disadvantages of the qualitative approach²²⁷:

- Highly time-consuming
- Demands considerable concentration from the interviewer
- “Difficult” interviewees
- The feeling of data overload as a result of the huge volume of rich data

Important benefit of qualitative research approach to this study was that it allowed changes during the research process. For instance, after the first interview the questions were modified in order to make answering easier. In addition, although the interviewees were from different countries representing different cultures, they all reacted positively to the chosen method. One of the disadvantages was that it was hard to distinguish the author’s own experiences and opinions from those of others because the author has been working as a virtual employee.

4.2 Data collection

This study rests upon multiple sources of data including a survey questionnaire, semi-standardized interviews and participant observation. Multiple sources of information were used in order to create converging lines of inquiry, i.e. the process of triangulation, to improve construct validity²²⁸ and to create objective assumptions²²⁹. Selection of the informants is presented first, though.

²²⁷ King 1994, 34.

²²⁸ E.g. Yin 2003, 97–99; Zalan & Lewis 2004, 515.

²²⁹ Marshall & Rossman 1995, 81.

4.2.1 Selection of informants

The Vice President of Human Resources of KONE Global Information Services, in cooperation with the researcher, chose the informants surveyed and interviewed. All of them were virtual team leaders in the case company, working at the “operational level” with tasks such as controlling, maintaining, developing and testing information technology as well as information systems. All of the virtual teams represented by the informants were globally organized, and thus several countries and cultures were represented.

4.2.2 Survey questionnaire

The survey questionnaire (see the Appendix 1) was to identify the most emerging challenges in virtual teams and create an understanding of the modes of interaction within the case organization. This was partly a pre-activity for the semi-standardized interview introduced in the next sub-chapter. The survey questionnaire consisted of the four following sections: informant’s background information, informant’s virtual team background information, modes of interaction in the informant’s virtual team, and challenges in the informant’s virtual team. The aim of the first three sections was to gather knowledge on the context of virtual teamwork in the case organization. As a whole, the survey questionnaire consisted of nine open questions excluding the questions regarding the backgrounds. The intensity of the use of different modes of interaction was measured with the Likert scale²³⁰, which consisted of 5 steps. The informants were to choose the alternative most accurately representing their opinion. The data collection method relied on theoretical propositions drawn from the literature review²³¹.

The survey question form, created with Microsoft Excel and pre-tested by two virtual team members not included in the final survey, was sent by e-mail to 12 virtual team leaders in the target group. The informants were given 10 days to fill in the form and send it back to the researcher. The informants were promised that their personal

²³⁰ Hirsjärvi 1997, 187.

²³¹ Yin 2003, 89–90.

information would not be mentioned in the Master's Thesis and that they could not be identified on the basis of their answers. Altogether, nine virtual team leaders returned the filled form.

4.2.3 Semi-standardized interviews

The semi-standardized interview (see the Appendix 2) was to gather more in-depth information on the challenges in virtual teams in the case organization. The operational analogue used in the semi-standardized interview was created on the basis of the literature review²³² and the answers of the survey questionnaires. The interview questions relied on the theory of four dimensions of virtual work invented by Vartiainen, Kokko & Hakonen²³³. Each dimension or interview theme consisted of three to six questions. In the end, some questions without a basis on theoretical propositions were asked. The goal there was to explore new aspects of the challenges in developing virtual teams, aspects not present in the existing theories. Overall, the interview consisted of 20 open questions. The interviewees were presented with revising and specifying questions when needed. The informants were asked to answer each question through examples and experiences of their own.

The interview questions were tested with a virtual team leader not included in the final survey. After that the questions were modified in order to make answering easier. All of the five actual interviews were conducted during June 2005. An interview took 45 minutes on average. Four interviews were conducted by phone simultaneously with the web conferencing tool, so that both the interviewer and interviewee shared the same Microsoft Power Point document containing the interview questions. The Power Point document was sent to the informants also prior to the interviews. All of the four interviews were recorded with the web conferencing system for further analysis. One of the interviews was conducted face-to-face and was not recorded by any means of technology. Three interviews were conducted in English and two, with the two Finnish-speaking managers, in Finnish.

²³² Yin 2003, 89–90.

²³³ Vartiainen, Kokko & Hakonen 2004a, 21.

4.2.4 Participant observation

The author was working as a trainee at Learning Solutions and Competence Development teams of KONE Corporation in the summer of 2004. He had the opportunity to participate in several projects, for instance in the areas of human resource development and employer image improvement. When the summer internship ended the author was offered an opportunity to write both the Bachelor's Thesis and the Master's Thesis on virtual teams for KONE.

The Bachelor's Thesis on challenges in virtual teams was conducted between September 2004 and January 2005. The empirical data collection consisted of five interviews with virtual team leaders from different units of KONE Corporation. This short review on virtual teams provided a good orientation into the field of virtual team research and insight into the case company. It had a major impact on designing the Master's Thesis.

These experiences, prior to the writing of the Master's Thesis, made it easier for the author to understand the context of the research. He had got personal insight into the elevator and escalator business, learnt about the history of the company and experienced the existing company culture of the KONE Corporation.

The author restarted working in KONE Corporation in February 2005. Along with writing the Master's Thesis, he participated in, for instance, designing an international management development program for virtual team leaders in KONE Corporation. This improved the possibilities to access information regarding virtual teamwork in the case organization. The author participated in many unofficial and undocumented discussions and meetings regarding virtual teamwork.

Participant observation also offered a good access to internal documentary material. For instance, e-mail-based announcement and internal documentary were used in order to supplement previous knowledge of the company as well as prepare for interviews. Moreover, some background information was collected through public written materials such as Internet-sites and journal articles.

4.3 Data analysis

As discussed, the theoretical framework guided the gathering of information through the survey questionnaire and the semi-standardized interviews. In the design stage of the survey questionnaire and the semi-standardized interviews, the questions were organized into main themes according to the model of dimensions in virtual work invented by Vartiainen, Kokko & Hakonen. This assisted in organizing and analyzing the empirical data.²³⁴

The data collected with both the survey questionnaire and the semi-standardized interviews was organized under the themes derived from the theoretical framework. The information gathered was studied in order to find sub-themes under the main themes. After that, each answer was put into right place for in-depth analysis. To save time, the answers of interviews recorded with web conferencing tool were not transcript word by word but the main ideas were captured. Finally, the answers were carefully analyzed and summarized.

4.4 Validity and reliability

To assess the overall quality of the empirical findings in this Master's Thesis, one must consider the data in terms of its validity and reliability. Validity in itself is concerned with the study's accuracy in reflecting and measuring specifically what the researcher has set out to measure²³⁵. According to Yin²³⁶, validity is composed of three different tests, namely construct validity, internal validity and external validity. Reliability deals with the precision of the actual measuring procedure, i.e. whether the study would produce similar results if conducted again using the same means²³⁷.

²³⁴ Yin 2003, 89–90.

²³⁵ King 1994, 31.

²³⁶ Yin 2003, 33–34.

²³⁷ Yin 2003, 34.

Validity

Construct validity is concerned with justifying the legitimacy of the selected measures in terms of accurately investigating the phenomenon under study. Certain precautions, i.e. using multiple sources of information as well as having peers and key informants preview and comment upon the preliminary results, are important means by which researchers can increase this component of validity.²³⁸ In addition to conducting survey and in-depth interviews, the researcher also studied diverse documentary material in order to improve the quality of the study. The author further addressed the issue of construct validity by arranging a pilot survey and interview and making changes according to feedback received.

Internal validity is primarily associated with causal or explanatory research²³⁹. As this study is more observational in nature and there was no manipulation of causal variables, the internal validity test is not relevant for this study.

External validity tests the generalizability of the study results, or in other words, measures the degree to which the findings and observations hold true in other settings²⁴⁰. Although qualitative case studies have been blamed for their potential lack in universal transferability of results, this criticism is somewhat ill founded and misleading. One must take into account that quantitative research yields statistically generalizable results about populations, whereas the qualitative approach allows for analytical generalizations relevant in light of the theoretical background.²⁴¹ Regardless of the inherent subjectivity of qualitative data, the results of a study can often be generalized beyond the scope of that particular context. This can be achieved through an understanding of the organization and the processes that guide the employees' behavior.²⁴² To increase external validity in this study, the literature review and the theoretical framework are used as a basis guiding the data collection process and management. Alternative explanations and solutions for the observed behavioral patterns are also discussed.

²³⁸ Yin 2003, 35–36.

²³⁹ Yin 2003, 36.

²⁴⁰ Marshall & Rossman 1999, 193.

²⁴¹ Yin 2003, 37.

²⁴² Hartley 1994, 225.

Reliability

In assessing the quality of empirical findings, reliability tests the extent to which the measures of procedures would produce the same results on repeated trials²⁴³. In other words, if other researchers were to repeat the course of action, it is important that they would come up with the same findings and draw the same conclusions. The ultimate goal of addressing the issue of reliability is to minimize subjectivity and bias.²⁴⁴

During the conducting of this study, all the components and stages of the data gathering process were documented in order to enable possible subsequent operationalization or reanalyzing of this study. The filled survey questionnaires were saved and the major part of the semi-standardized interviews taped with the web conferencing system. As the data collection primarily consisted of in-depth interviews, each varying according to the interviewee's mood, personality and individual response, the outcomes would naturally differ somewhat during a potential second round of interviews. However, the core of the responses would be expected to remain essentially the same.

²⁴³ Yin 2003, 34.

²⁴⁴ Yin 2003, 38.

5 CASE COMPANY - KONE CORPORATION

Empirical research was conducted within KONE Corporation's Global Information Services organization. In this chapter, KONE Corporation and its employees are first introduced and the after that KONE Global Information Systems.

5.1 History of KONE Corporation

KONE was founded in the fall of 1910. The company was originally a repair shop for electric gadgets and a daughter company of Gottfried Strömberg Ltd.²⁴⁵ Soon, in 1912, the company focused on importing elevators of Graham Brothers, the leading elevator company in Scandinavia. However, the license agreement was terminated as soon as 1917 and in the following years, KONE started selling elevators under its own name.²⁴⁶

The mother company Strömberg got into financial difficulties in the early 1920s²⁴⁷. In 1924, Harald Herlin, an engineer working for the company, bought all shares of KONE, and the Herlin family has been controlling the company to date²⁴⁸. The company rapidly gained presence in Finland, and delivered elevators for instance to Stockmann's department store and to the Finnish parliament house in Helsinki in the 1930s, which were the first significant orders²⁴⁹.

With the recession in the 1930s the demand for elevators declined and KONE started to diversify its product offering. It incorporated cranes, electric hoists and a self-manufactured electric motor, which allowed KONE to manufacture elevators without sourcing any single part of the product. With the reconstructions after the Second World War, the demand once again increased, and KONE also participated in Finland's war

²⁴⁵ "History of KONE Corporation". International webpage of KONE Corporation
<<http://www.kone.com/en/main/0,,content=48337,00.html>>.

²⁴⁶ Komsu, Lindström & Zetterberg 2002, 71–72.

²⁴⁷ Salmi 1994, 5.

²⁴⁸ Komsu, Lindström & Zetterberg 2002, 72.

²⁴⁹ Salmi 1994, 5.

reparations made to Russia. These included bigger cranes than KONE had ever manufactured, and also, for the first time in production, cranes for harbors.²⁵⁰

The elevator industry had begun to integrate in the 1960s and acquiring competitors was a very common phenomenon. The new managing director Pekka Herlin, representing the third generation of Herlins in KONE and the first who had acquainted himself with modern corporate management theories, realized that the company had one reasonable alternative: to seek growth and become an independent, international operator. He desired to keep the family business alive.²⁵¹ As a mode for internationalization and growth KONE chose acquisitions. There was also an industrial motive behind it: the buildings in Finland were low-rise ones, and if KONE wished to offer high power elevator solutions to skyscrapers, it needed to acquire new technological knowledge.²⁵²

In the late 1960s KONE was technologically advanced but financially in a deterred condition²⁵³. After listing the company's stock in Helsinki Exchanges in 1967, the expansion started in Scandinavia the following year as KONE acquired the Nordic elevator operations of the Swedish-based Asea-Graham. The target was a bigger company than KONE at that time, but the gamble of Pekka Herlin succeeded.²⁵⁴ Never before had a Finnish company expanded to become a truly multinational corporation; KONE was the pioneer²⁵⁵. In the 1970s the same pattern was repeated, when KONE acquired the European elevator operations of the American Westinghouse Electric Corporation, the target again being a larger company than KONE itself²⁵⁶.

In the process of internationalization, it proved not to be difficult to find target companies, since there was no future for small or medium-sized companies in the industry. However, the industry was very susceptible to economic fluctuations with which KONE coped by diverting increased focus to maintenance and service operations and further diversifying its portfolio.²⁵⁷ By the end of the 1970s, KONE had grown to

²⁵⁰ Komsu, Lindström & Zetterberg 2002, 72–73.

²⁵¹ Salmi 1994, 8.

²⁵² Salmi 1994, 10.

²⁵³ Herlin 2003, 154.

²⁵⁴ Salmi 1994, 10–11.

²⁵⁵ Komsu, Lindström & Zetterberg 2002, 74.

²⁵⁶ Salmi 1994, 22.

²⁵⁷ Salmi 1994, 11.

be one of the largest elevator manufacturers in the world²⁵⁸. It also became one of the world's leading suppliers of hoists and cranes²⁵⁹.

As the recession came to Europe and also severely struck Finland in 1990, KONE began to return to its roots. The focus was once again elevator and escalator businesses, and practically all the non-core units were divested before 1995. Perhaps the most interesting of these divestment decisions was that of Kone Cranes, which was sold to a Swedish investor consortium and operating management.²⁶⁰

To some extent it is unclear, what made KONE return to its core. During the spring of 1994, just after the divestment of Kone Cranes, rumors in the markets said the Herlins would sell the company to a German group called Thyssen, perhaps because there seemed to be no person in the Herlin family that would take over the company upon Pekka Herlin's retirement. However, Antti Herlin stepped into his father's shoes and became the CEO in 1996.²⁶¹ Another view to the divestments is that KONE was about to further strengthen its elevator business. In the fall of 1994 KONE acquired full ownership of American manufacturer Montgomery, and thereby gained a significant foothold of the American markets.²⁶²

After focusing in elevators and escalators, the technological innovations introduced in the latter part of 1990s gave KONE an edge with respect to its competitors²⁶³. Both sales and operating margin continued to grow, which made the share price soar in Helsinki Exchanges, clearly outperforming the industry index and continuing to rise even after the overall market downturn in 2000. However, KONE recognized that in the supplies of new products there was not enough growth available to meet the company's goals. In the late 1990s KONE had already become a service organization with more than half of its sales coming from maintenance operation. Furthermore, KONE has been seeking extensive growth by investing heavily in maintenance of automated doors

²⁵⁸ "History of KONE Corporation". International webpage of KONE Corporation
<<http://www.kone.com/en/main/0,,content=48337,00.html>>.

²⁵⁹ Komsı, Lindström & Zetterberg 2002, 74.

²⁶⁰ "History of KONE Corporation". International webpage of KONE Corporation
<<http://www.kone.com/en/main/0,,content=48337,00.html>>.

²⁶¹ Repo 1994a.

²⁶² Repo 1994b.

²⁶³ Komsı, Lindström & Zetterberg 2002, 74.

operations since 2001. In addition to acquisitions, the creation of strategic alliances has proven to be a successful way for KONE to gain competitive advantage in its industry. By far the most important of KONE's alliances was initiated with Toshiba of Japan in 1998.²⁶⁴

Focusing on the core, however, did not last long. In 2002, KONE acquired Partek, a Finnish industrial engineering company with net sales equal to KONE's. Partek has specialized in container handling, load handling, forest machinery and tractors. In 2003, KONE decided to concentrate on Container Handling and Load Handling and thus other businesses were sold piece by piece. In June 2005, the new and old businesses were split into two and listed two different companies in Helsinki Stock Exchanges.²⁶⁵ One company comprises KONE's existing elevator, escalator and building door service business and continues to operate under the name KONE Corporation. The other company comprises the new business areas and operates under the name Cargotec Corporation.²⁶⁶

Today, KONE Corporation is the world's fourth largest elevator company, with the market share of 9 %, and provides solutions for the installation, modernization and maintenance of elevators and escalators and the maintenance of automatic building doors. The company operates in 800 locations in over 40 countries. KONE has annual net sales of approximately EUR 2.9 billion. Antti Herlin still continues as the CEO and deputy chairman of the board. The presidency of KONE has been ceded to non-Herlins since 1987. Today, the president of KONE Corporation is Mr. Matti Alahuhta, the former Executive Vice President of Nokia Corporation.²⁶⁷

²⁶⁴ "History of KONE Corporation". International webpage of KONE Corporation
<<http://www.kone.com/en/main/0,,content=48337,00.html>>.

²⁶⁵ Organization was split into two during the making of this study.

²⁶⁶ "History of KONE Corporation". International webpage of KONE Corporation
<<http://www.kone.com/en/main/0,,content=48337,00.html>>.

²⁶⁷ KONE Corporation 2005.

5.2 Personnel

5.2.1 Personnel by market and job category

KONE Corporation has approximately 25,600 employees²⁶⁸. The following Chart (Figure 10) shows the dispersion of the employees by market areas. Over six out of ten employees work in Europe, Middle East and Africa (EMEA) and about 19 % in North, Middle and South America.²⁶⁹ 20 % of personnel are employed in Asia-Pacific²⁷⁰, where residential construction business is growing rapidly²⁷¹. Among Finnish companies, KONE is highly internationalized. Due to the numerous acquisitions the company is dispersed all over the world. Only 7 % of the employees are working in the home country of the corporation, Finland. The Table 4 exhibits the largest KONE countries by employees.²⁷²

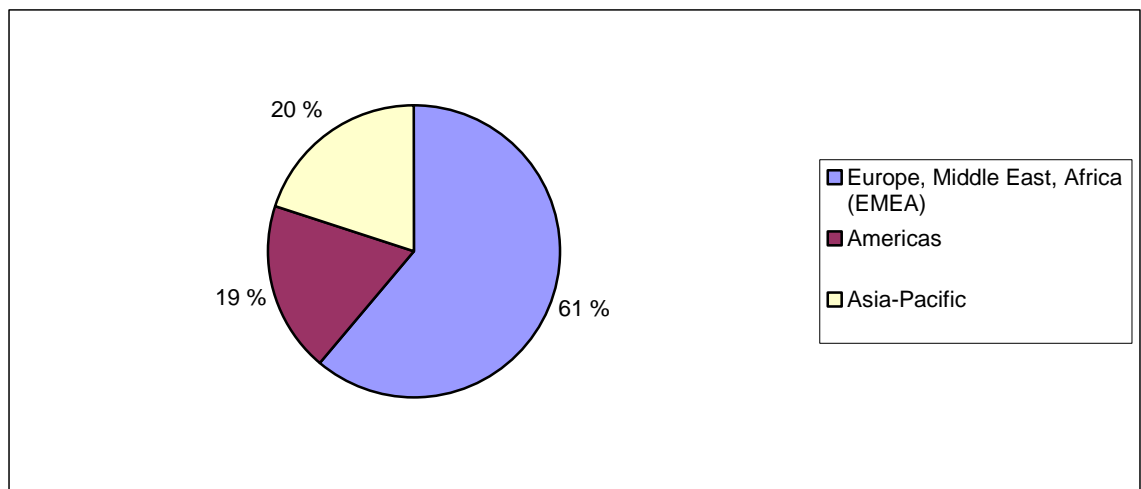


Figure 10. Employees by market in 2005.²⁷³

²⁶⁸ KONE Corporation 2005, 2.

²⁶⁹ KONE Corporation 2005, 13.

²⁷⁰ KONE Corporation 2005, 13.

²⁷¹ KONE Corporation 2005, 7.

²⁷² KONE Corporation 2004a.

²⁷³ KONE Corporation 2005, 13.

Table 4. KONE employees by the country in 2004.²⁷⁴

Rank	Country	Employees
1	United States	4157
2	France	3097
3	United Kingdom	2003
4	Italy	1815
5	Germany	1806
6	Finland	1566
7	China	1354

The personnel is divided into different functions as follows: six out of ten employees work in maintenance and modernization services, one fifth in new equipment sales and installation, one tenth in manufacturing, and less than one tenth in administration, IT or R&D (see the Figure 11).²⁷⁵

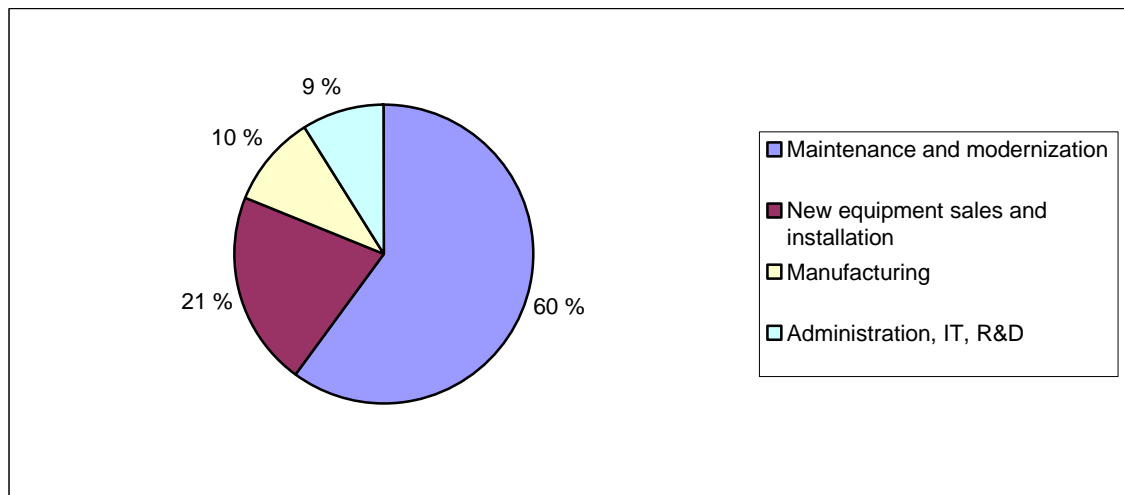


Figure 11. Employees by job category in 2005.²⁷⁶

5.2.2 Employee satisfaction

In the spring of 2004, KONE Corporation carried out its first global employee survey that covered the elevator and escalator businesses. A total of 11,977 employees from 23 countries replied, for a response rate of 57 %. The survey charted job satisfaction with

²⁷⁴ KONE Corporation 2004a.

²⁷⁵ KONE Corporation 2005, 13.

²⁷⁶ KONE Corporation 2005, 13.

supervisor work, internal cooperation, communications and KONE as a workplace.²⁷⁷

According to the results of the survey, KONE's strengths are:

- Very strong affinity and commitment to KONE
- High levels of pride and a strong desire to become more involved with KONE
- Strong belief that KONE will continue to be successful
- Fair treatment of employees
- Good understanding of, and commitment to, objectives at all levels
- Belief in the credibility of information received²⁷⁸

On the other hand, need for development was identified within leadership methods and interactions skills. Employees named the following areas of improvement:

- Improving job satisfaction
- Improve the perception of line management
- Improve performance feedback and development opportunities
- Greater focus on measuring and managing customer feedback
- Improving communication and cooperation at all levels with greater employee input²⁷⁹

Overall, employees seemed pleased with working in KONE. According to human resource managers, the results were positive as well as fairly impending. To follow-up the results of the survey, each KONE unit has implemented new action plans, starting from the summer of 2004²⁸⁰.

5.3 The case organization - KONE Global Information Services

A virtual organization by the name of KONE Global Information Services (KONE GIS) was established in January 2005. Previously, the information system (IS) and

²⁷⁷ KONE Corporation 2004b.

²⁷⁸ KONE Corporation 2004b.

²⁷⁹ KONE Corporation 2004b.

²⁸⁰ KONE Corporation 2005, 12.

information technology (IT) services for KONE Elevators & Escalators were locally organized. The goal for combining the forces under one organization was to increase collaboration across unit and national borders and thus gain synergy effects all the units could profit from. In the beginning of June 2005, after operating for five months only and while this study was done, KONE GIS faced a new reorganization. Some of the functions were rationalized in order to operate more efficiently still. The changes in this stage affected the management team of KONE GIS the most.

The transformation into a global organization can be justified in several ways. First of all, the information systems are globally organized, and the supporting employees can best serve the information systems by being organized globally as well. The enterprise resource planning system SAP, for example, operates across country and unit boundaries. In addition, KONE GIS is constantly testing and piloting new information systems and communication technologies. When organized globally, the same way the whole KONE Corporation is, KONE GIS can identify the issues problematic in normal business life situations. Secondly, tasks such as controlling e-mail traffic can be circulated over time zones so that the employees do not have to work at nighttime. Thirdly, dispersed organization is supposed to be good for effective information sharing. Understanding the latest technologies is essential for KONE GIS. Knowledge sharing occurs not only in KONE GIS but also across its boundaries to the whole KONE Corporation.

While the reorganization of KONE GIS was made, many other organizational changes took place. Traditionally, processes in KONE were owned by various business units, which tended to operate in their own “silos”. The changes that need to be made are designed to remove overlaps in different process areas and increase focus on the customer. They will lead to productivity gains, create a clearer division of responsibilities and emphasize collaboration instead of “not invented here” mentality. KONE's new strategy requires a change in the company's process architecture.

The KONE GIS strategy defines four key processes: customer processes, product creation processes, delivery processes, as well as management and support processes. They cut across all business units and global functions and animate the way KONE GIS

is working. The following figure (see the Figure 12) is an organizational chart of the KONE GIS management team, and it gives an idea of the organizing patterns.

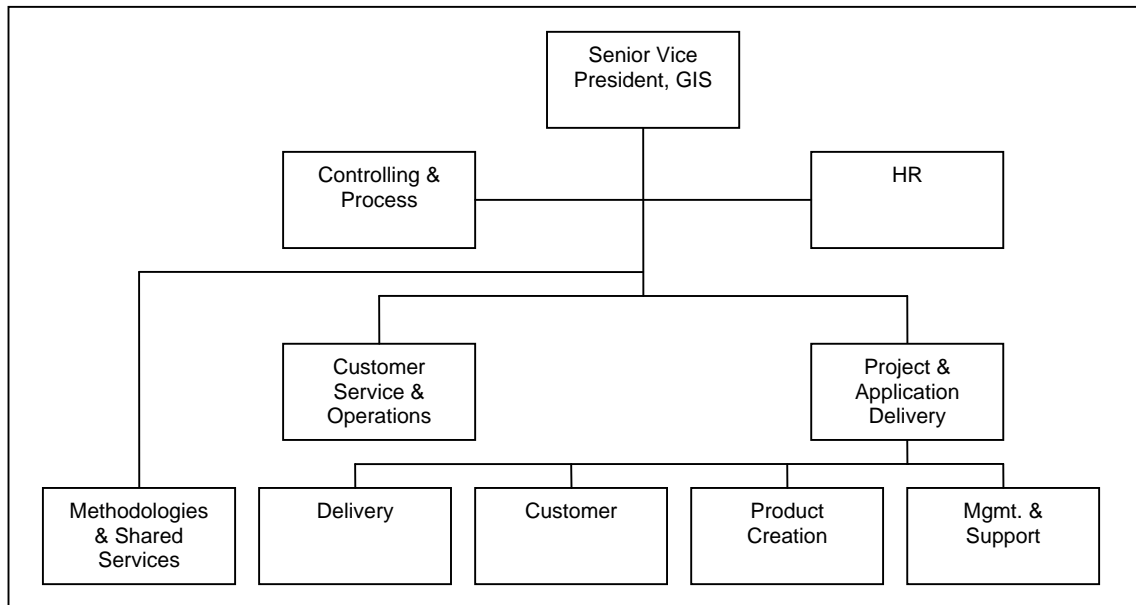


Figure 12. KONE Global Information Services management team.²⁸¹

KONE GIS is truly a dispersed and virtual organization. The members work in different locations, countries and continents. The following statistics, which consist of two upper tiers of the organization management, exhibit the diversity of the members:

- 17 nationalities represented working in 11 countries
- 4 continents represented
- Average 9 years of KONE experience
- 471 cumulative years of KONE experience
- Average age: 40
- Breakdown by gender: 44 men, 11 women²⁸²

In spite of a promising start, new working methods have been difficult to adopt and the organization fails to work to the desired degree. Thus there is currently need to improve the quality of virtual working within KONE GIS.

²⁸¹ KONE Organizational Chart.

²⁸² Stephen Bridges' e-mail message to the KONE GIS organization members.

6 EMPIRICAL FINDINGS

This chapter presents the empirical findings of this study. First, the challenges in developing virtual teams in the case organization are discussed in-depth. As in the literature review, the challenges are categorized according to the dimensions of virtual work invented by Vartiainen, Kokko & Hakonen²⁸³. Moreover, the effectiveness of virtual teamwork is discussed.

6.1 Place

The virtual teams supervised by the surveyed and interviewed supervisors were highly dispersed. They consisted of members from the following countries: Australia, Belgium, China, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Netherlands, Singapore, the United Kingdom, and the United States²⁸⁴. Contacts between team members working on different sides of the world was said to be complicated, and communication to be much more irregular in virtual teams than in traditional ones.²⁸⁵

6.1.1 Social wellbeing

Infrequent communication has a negative effect on the development of togetherness between team members. According to the informants this is mainly a result of the sense of isolation of peripheral virtual team members and, consequently, the lack of commitment.

Daily contacts are scarce in a virtual team, and members working on different locations may experience a sense of isolation. They may perhaps feel that the supervisor pays less

²⁸³ Vartiainen, Kokko & Hakonen 2004a, 22.

²⁸⁴ One supervisor had subordinates' and subordinates' subordinates totally in 16 countries but these countries were not mentioned in the survey questionnaire.

²⁸⁵ Although the mobile way of work was introduced in the theoretical part, it is not discussed here. The supervisors interviewed are not doing mobile work in an extent for it to have a major impact on their work.

attention to them than to the other members. Dispersed members working alone usually have a stronger sense of isolation than members working together. “If people do not see their boss daily or weekly, they feel they are not being recognized in the same way the ones that work directly with the boss are. It is also difficult to gauge moral, to determine if someone is having personal problems, whether they have the right workload, etc. During times of reorganization and change, the remote people feel especially isolated and require extra attention.” According to the informants, members of dispersed teams experience isolation in various ways. Some need social contacts more than others. A certain type of person may work extremely efficiently when isolated from other members of the team. Therefore, sensitivity and knowledge of human nature are required of a supervisor of a dispersed team. For instance, more than half of a certain virtual team is working in Brussels and the rest work in different locations dispersed all over the world. Decision-making is naturally based mostly in Brussels, especially since the supervisor works there as well. Some decisions concerning the entire team are made without hearing the peripheral members. According to the supervisor, decisions have to be made with special sensitivity to avoid the sense of isolation and “stepping on toes”.

The interviewees had diverse experiences about dispersed members’ commitment to virtual teamwork and projects. It has been noticed that members working on several projects simultaneously sometimes tend to focus more on the projects in which they are part of the core team, than on projects in which they are working dispersed remote from each other. Supervisors see this partly as a consequence of lack of control and interaction. Team members of a local project form a sense of togetherness easier, and solidarity has a notable influence on commitment. People commit gladly to a challenging and interesting project. “The workers are proud when they create something completely new, and pride of this kind furthers commitment.” Thus, delegating appealing and skill-demanding tasks is one of the central challenges for the supervisor. Assembling the right kind of team for a project demands similar attention.

“In a conventional work environment it is easier for the team members to feel the leadership and for the manager to become a reference point for any needs – professional and personal included.” Thus, virtual team leaders have to make more time for human resources management related issues. Supervisors working on research and development related projects considered it almost obligatory to have everyone face-to-

face in the first meeting in order to make the virtual teamwork project successful. This way the members will learn to know each other both as workers and personalities, and trust between team members will be achieved easier.

Nevertheless, meeting face-to-face is not always possible. In virtual work environments, one of the challenges for a supervisor surveyed and interviewed is to bring about a believable “virtual presence” between these small groups so that the members can feel they are part of one big group. In addition to formal work related communication, informal virtual communication is needed as well. Mediating feelings through media may not be easy, but it is not impossible. In the beginning of virtual teamwork especially, there is not much informal communication, but it increases as time goes by. Virtual presence is best created by “providing the right atmosphere” as well as “over communicating”. This results in the self-motivation and self-commitment of virtual team members. Moreover, this way the dangerous consequences of untruthful rumors can be avoided.

6.1.2 Trust and openness

Trust and openness were said to be the fundamentals of virtual teamwork. Members of a virtual team have to trust each other in order to work together flexibly. A few supervisors had been in situations where their trust towards a team member had shaken. Since it is impossible for directors to be constantly supervising their subordinates working on different locations, they simply have to trust in their employees’ abilities to perform their tasks. In a virtual work environment it is difficult to clarify cases in which performing a task has for some reason failed or been delayed. In such cases the supervisor has to consider whether the employee has not understood or been able to perform the task, whether the employee has been overloaded with work, or whether there have been other causes, such as conflicts between members of the team.

Even though disappointments in the matter were rare, building trust between members of the team was considered one of the most important tasks for the supervisor. Once again, the team leader is in the key role of creating the right kind of atmosphere. This is

done mainly by bringing the team members together either face-to-face or through communication medias.

6.1.3 Controlling and giving feedback

“It is more difficult to know and feel what is happening far from you. As a consequence, being proactive with your team problems and quickly putting corrective actions in place may be harder.” Dispersion makes managing virtual team members more difficult. Thus, virtual teams require more time and attention from the managers.”

The employee’s status of work is hard to see in a virtual work environment. “Unlike in a conventional team, there is no possibility of dropping by a subordinate’s desk and asking how it is going”. Furthermore, although there is a specific information system for measuring the employees’ workload, it is hard to see if the subordinate is overloaded or under loaded. According to supervisors, controlling can be done through communicating frequently or asking subordinates to report in regularly. “You need to communicate with the people more, you need to see how they are and check up more to ensure that targets are met.” This may, however, lead to a situation where the employees feel over controlled. Nevertheless, “the results speak for themselves” in work that demands professional skills, and members performing inadequately will be easily recognized over time. Owing to insufficiency of control, defining shared goals becomes more important. Clearly defined objectives guide the members of the team towards the collective aim.

Providing feedback in a dispersed work environment turned out problematic. Feedback given via technology is usually highly concise and fact-oriented, whereas meeting face-to-face enables a richer conversation. When communicating via technology, the participants become more reserved and thus the conversations may fail to reach the required depth. Giving negative feedback is often especially difficult. Moreover, the medium of interaction has an essential role in giving feedback. In a dispersed team, presenting feedback regularly is considered an important task of the supervisor. It is also a way of paying attention to the members of a team and showing interest in their work.

6.2 Time

Meetings through technological aids are usually troublesome to organize due to time differences. Finding a time slot suitable for all parties can be a task in itself. In addition, virtual teams are often temporary project teams and fixed-term nature brings additional demands on work.

6.2.1 Time zones

As a consequence of asynchronism, members of the team usually have to flex with their working hours. For instance, telephone conferences between the virtual team members in Belgium and China are organized Belgian time early in the morning, while telephone conferences between Belgium and the United States take place late in the evening. This reportedly demanded patience from virtual team members. Some teams had organized meetings across three or more time zones through conferencing technologies. However, in the case where the different locations of the virtual team members make it impossible to find a time slot allowing everybody to participate at daytime, two separate meetings are preferred instead. In several dispersed teams of KONE GIS it is almost impossible to bring all the members together for a common virtual meeting. According to the informants, members of dispersed teams are happy to participate in an evening meeting if the alternative is, for example, an exhausting 72-hour business trip. The former means more time at home with the families, and this has a further positive impact on the wellbeing of team members. Some virtual teams have exploited the recording feature of a web conference – members not taking part in the conference can watch it later on their own computers. This, however, prevents the individual from taking an active role in the meeting, and for that reason is not very popular.

It is important to note that time differences also have an influence on the communication between two individuals. It is, for instance, easier for a European to call another European than an Australian because their working hours overlap more. Phone

calls between two different time zones are often agreed upon in advance through an asynchronic communication technology such as e-mail.

In KONE GIS, recycling tasks from a time zone to another is quite common. The objective is to utilize the whole working day of 24-hours. This is done mainly by dividing the working day into shifts since team members are dispersed evenly around the world. For instance, a virtual team had an IT project where the testing was based in Australia and New Zealand while the developing and fixes were based in the United Kingdom. Thus, testing was taking place while the Europeans slept. "This saved not only time but money as well." In routine work, such as e-mail controlling, work can be divided into three shifts so that the virtual team members have 8-hour working days in each location. As long as the people do not need much supervising, recycling tasks from time zone to another is possible. However, recycling tasks requires effective managing. If a part of a task is not as ready as expected, it might cause confusion among the team members. On the other hand, recycling professional tasks is often impossible because they usually demand special expertise only one member of the team might have. Nevertheless, vital reports, for example, could sometimes be written in another time zone if they are urgently needed somewhere else the next day.

Working across time zones is always demanding as virtual teams of KONE GIS are usually dispersed in different continents. According to supervisors, members of virtual teams gradually get accustomed to an asynchronic work environment nevertheless. The problems usually arise mostly in the early stage of virtual teamwork.

6.2.2 Temporariness

Some virtual teams of KONE GIS, especially the teams working with development tasks, do project work. As project work is by nature temporary the team assembly may change from time to time. According to supervisors, though, the turnover of virtual team compositions has not been notable²⁸⁶. Especially in demanding development projects it is reasonable to use permanent members who represent the best skills of their

²⁸⁶ While the interviews were done KONE GIS had been working only half year and this may be one reason why there had not been any remarkable changes in the virtual teams at the operational level.

work fragment. Moreover, a team functions effectively when its members know each other's ways of working and communicating. In assembling teams for new projects, however, rotation of tasks has to be remembered. New members bring new ideas into teams already fallen into a routine and change the distribution of tasks in the teams. In addition, the rotation of tasks has an effect on how the members learn. A change in an established team assembly naturally causes disturbance. According to supervisors, it takes some time before new experts "find their place" in dispersed teams. High motivation usually compensates inexperience.

Before KONE GIS was established, the employees developing and maintaining KONE information technology and information systems were locally organized. As the reorganization happened the employees found it difficult to give up the mindset of working in the old organization. Employees who had sat side-by-side wished to continue working together although they were already in new virtual teams. According to the informants, this is one of the major troubles in the developing stage of virtual teams. Especially in Brussels, where numerous KONE GIS employees are working, this has caused major problems.

6.3 Diversity

The informants find diversity of virtual team members to have both positive and negative effects on the success of tasks. "Working in a virtual environment provides more opportunities for diversity which brings new perceptions and innovation to the team. At the same time, it helps put the global aspect of the company in perspective. Having people spread across the world helps us have better understanding."

6.3.1 Cultural differences

According to the virtual team supervisors of KONE GIS, cultural differences have a major impact on working. People express things differently depending on their culture. For instance, the plainspoken way of the Italians in the meetings felt very different from the Nordic way of negotiating. It is essential to understand the cultural differences in,

for instance, habits of talking, listening, comprehending and working between members of virtual teams. This understanding helps virtual team members approve each other. Informants said that teams might suffer from misunderstandings caused by low cultural awareness mostly in the beginning of virtual teamwork. In extreme cases, a cultural clash can have a negative effect on social relationships and teamwork. However, cultural clashes in virtual teams of KONE GIS have not had any longitudinal effect on the functioning of virtual teamwork. Persons working in a multicultural environment have adapted to a new way of working quite rapidly. Knowing that their peers represent different cultures, they are accustomed to tolerating occasional cultural clashes.

Nevertheless, KONE has a long tradition of being a multicultural organization since it has been operating in many countries for decades. Furthermore, the company has many cross-unit and cross-functional units where people from different nations are working for the same purposes. Thus, some leaders assumed that problems arising from the cultural backgrounds of virtual team members are relatively small in the company.

When asked how virtual team leaders create team spirit and commitment in multicultural work environments, the two following ways were often mentioned. First of all, they strive to organize face-to-face meetings in order to get the members know each other in person. Working with a stranger is always challenging but working with a stranger with a different cultural background is even more difficult. The greatest need for face-to-face communication is in the beginning of virtual teamwork or project²⁸⁷. Secondly, the supervisors try to communicate with team members as much as possible. Each meeting face-to-face or through communication medias increases the awareness of others. An informant mentioned the need for “over communicating” several times. Leader’s ability to manage diversity is important as well. A virtual team leader should be aware of different cultures and in this way provide a good example. In addition, the leader should show a positive attitude, especially in situations where collaboration is jeopardized due to difficulties in communication between multicultural members of the team. All things considered, leading a multicultural virtual team requests a great deal more sensitivity than leading a team of members with similar backgrounds working in one location.

²⁸⁷ Face-to-face communication is discussed more in-depth in the sub-chapter 6.4.1.

6.3.2 Language barriers

The official language for KONE group of companies is English. It means that in international units, such as KONE GIS, providing documents and written material in English is the default practice. Language of spoken communication in a multilingual environment should be English, but other languages are often used as well. Time and again, colleagues choose the most familiar language for mutual communication. According to informants, writing in English does not cause many problems in virtual teams of KONE GIS. Meetings, especially virtual conferences, were more difficult due to language barriers. In face-to-face situations non-verbal cues help the members understand each other.

Language barriers were said to be the greatest in the beginning of virtual teamwork. Some teams, though, had members who had been working in virtual teams before KONE GIS was established. Thus, problems caused by language are different from team to team. An interviewee said that language skills should be taken into account when composing a team. On the other hand, the company could have a greater influence on the development of the employees' language skills by placing them into multilingual teams. It might promote collaboration in the entire organization as the collective language use develops. KONE GIS does not offer systematic training in English. The members have to lean on the language training provided by their locational units. The differences in language skills are vast. Chinese and Indian accents were reportedly the most difficult to understand.

To sum up, language barriers in KONE GIS have dropped since the organization was established. The informants predict them to drop even more as time goes by. One of the informants said that five years ago English skills in KONE Corporation were at a lower level than today. As companies become more international, the need for a common language grows. Fluent English is one of the most important requirements for virtual employees of KONE GIS. Innovations are often created from "weak signals", which may be difficult to refine if a person cannot explain the matter to others clearly.

6.3.3 Creativity, innovativeness and learning

The interviewees find differences between team members to have their influence on innovativeness. When different people bring forth their knowledge and skills for everyone's appraisal, new ideas and efficient methods may emerge. Combining different "ways of thinking" may produce positive results. As one of the surveyed supervisors wrote: "The most important advantage is in the area of problem-solving, where different cultures, or more precisely, different points of view, could help find new solutions for different problems". For instance, co-operation between the Finnish and the Japanese was considered innovative due to their different outlooks on life. Unlike the Finnish, the Japanese do not like to categorize things and thus limit their thinking. Although diverse teams were said to be innovative, communication through medias usually limited creativeness. According to supervisors, virtual brainstorming sessions are not as innovative as conventional ones.

According to supervisors, differences in people do not automatically bear innovativeness, though. People have to feel that innovating is respected and authorized. Supervisors have to give time for innovation and maintain communication. In addition, the will to listen to innovations is important, which means that other team members must be ready to accept new ideas. Some of them thought it essential for a multinational team to be able to define a shared "state of will" at the beginning of a project. When all members of the team know exactly what the goal is, they can estimate how well their performance will promote their objective. "State of will" is a useful tool when it is defined to a simple form easy to understand and remember. Once again, the supervisor has a pivotal position as a creator of an atmosphere of innovativeness.

6.4 Mode of interaction

In the survey questionnaire the leaders were asked to estimate on average the intensity with which their team members communicate through different means of interaction. The informants had five answers to choose from: several times a day (5), several times a week (4), several times a month (3), once a month (2), and less (1). When analyzing the results, the options were transformed into numeric form (see the numbers in the

brackets following the options) so that average figures of the different uses could be calculated. The following table (Table 5) ranks the popularity of the modes of interaction as well as shows the intensity of use and the standard deviation.

Table 5. Modes of interaction in KONE GIS.

Rank	Mode of interaction	Intensity	Standard Deviation
1	E-mail	4.78	0.44
2	Phone	3.78	0.44
3	Teleconferencing	3.33	0.50
4	Web conferencing	2.78	1.09
5	Voice mail	2.56	1.42
6	SMS (Text messaging)	2.22	1.30
7	Face-to-face	1.78	1.30
8	Collaborative software	1.33	1.41
9	Videoconferencing	1.22	0.83
10	Post	0.89	0.33

6.4.1 Necessity for face-to-face collaboration

KONE GIS had been operating for merely half a year at the time the conduct of this study began. Some of the virtual teams had met face-to-face several times while others had not met once. Usually, meetings among the core team working in the same place or relatively close to each other are more frequent than meetings among the entire team with peripheral members included. “This is mainly due to cost constraints. We can't have people from all over the world flown in for team meetings.”

Nevertheless, the informants consider face-to-face meetings necessary in situations such as:

- In the beginning of a virtual project
- When the task is complex
- When giving feedback
- When creating team spirit and commitment
- In “human resource management related discussions” between the team leader and subordinates

Supervisors had different opinions on the stages of a virtual project at which face-to-face meetings are necessary. Everybody agreed, however, that gathering together for a kickoff meeting is important and sometimes necessary. In the beginning of the project there is a great need for knowledge sharing as well as introducing the team members to each other. Supervisors of teams with permanent member lineups (not doing projects) considered meeting in the beginning of virtual teamwork important. Supervisors also mentioned other project stages where face-to-face meetings are necessary. Some of the teams meet at a regular basis in order to follow-up and plan activities for the time preceding the next meeting. While some teams meet once a month, others meet a few times a year or even more seldom. One of the informants said that their team meets when reaching project milestones agreed in the kickoff meeting.

According to most of the informants, the need to meet face-to-face depends mainly on the task complexity. They do not see information and communication technology replacing face-to-face meetings for a long time to come. A great advantage of a face-to-face meeting is the opportunity to read non-verbal communication. For instance, distributing demanding technical tasks over the telephone can be very challenging, since the supervisor cannot interpret the facial expressions of the employee. "If the employee is very quiet, it is difficult for the supervisor to estimate whether the message was understood or not." Furthermore, virtual teams of KONE GIS favor face-to-face meetings especially when the team is creating something new together as in when brainstorming. Routine tasks, in contrast, often do not require face-to-face collaboration. One of the informants said: "Our team has not met face-to-face at all during the first six months of work since we are dealing with routine issues that do not call for daily managing and controlling." It could be said in general that the more demanding the project, the greater the need for face-to-face meetings.

Giving feedback was considered to be much easier face-to-face. In communication over the e-mail, for example, delay times become so long that possible conflicts easily begin to "live a life of their own". Giving negative feedback through communication medias was said to be especially difficult. From time to time, however, giving feedback electronically cannot be avoided. If a supervisor or a co-worker wishes to point out an inadequately performed task to a team member, synchronic means of communicating are better than asynchronous. Discussing negative things demands real-time

communication, because the employee often wishes to present questions and comments. For this reason, if a face-to-face meeting cannot be arranged, supervisors try to give feedback to members of dispersed teams over the telephone.

Face-to-face meetings were considered important because through them co-workers get to know each other better, develop their team spirit and commit to each other. The results are easier to distribute when team members are motivated for work. “Above all, face-to-face meetings are important for resources motivation, for better and stronger transmission of values and messages, for aligning the team and for discussing topics that most team members consider very important for their own job motivation.” Hence, some teams have face-to-face meetings regularly not only to agree on common issues but to maintain motivation as well.

“We organize face-to-face meetings when people have HR issues and need to have a detailed discussion with their managers.” According to a supervisor, “human resource management related issues” between supervisors and subordinates should rather be discussed face-to-face than through communication medias. Issues, such as pay performance and personal development plans, demand a great deal of sensitivity.

6.4.2 Use of some popular communication medias

The use of the most popular communication medias is discussed here in order to clarify the patterns of communication in KONE GIS.

E-mail

E-mail is clearly the most popular mode of interaction in virtual teams of KONE GIS. It is used for all kinds of daily communication. According to informants, e-mail technology is quite flexible. An e-mail message can be delivered to many respondents at the same time and thus it supports effective knowledge sharing. Messages are usually short and precise and the respondent does not have to use a great deal of time for interpreting. In a multilingual work environment, the risk of misunderstandings

decreases since the sender has more time to create the message and the respondent to adopt it.

Nevertheless, supervisors faced several problematic issues when using e-mail. The use of e-mail often leads to information overload, resulting in deletion of messages without them being read. “The members receive dozens or even hundreds of e-mail messages per day, which makes it sometimes difficult to recognize the important ones and the ones demanding a quick response.” E-mail can be a frustrating communicating media for a sender expecting an immediate response, because the frequency of checking one’s e-mail varies a great deal from person to person. In addition, being an asynchronous technology, e-mail often fails to share information on the context underlying the message, such as the background behind the decisions made.

Phone, SMS, and voice mail

Virtual team members use the phone for teamwork several times a week. Discussions over the telephone are useful for all kinds of daily interactions and especially when the topics require rapid decisions and actions. Telephone conversations, however, do not support effective knowledge sharing since they occur between two team members only. Furthermore, in multilingual virtual teams there are always risks of misunderstandings. According to interviewees, employees speaking English as a second language may have feelings of inadequacy when talking with a more skilled speaker of English over the telephone. Moreover, in conversations between two non-native English speakers, a listener cannot always tell whether he or she is hearing incorrectly or the speaker is using the language in a flawed manner. In a dynamic work environment, reaching a peer ad hoc by telephone may be demanding. Virtual team members often use e-mail or an electronic calendar (a feature of an e-mail solution) for scheduling phone calls in advance.

Most virtual team members in KONE GIS have mobile phones, and hence they can send and receive SMS and voice mail²⁸⁸. According to some informants, SMS can only be used in few situations that do not require delivering detailed information. For instance,

²⁸⁸ The fixed line phone does not usually have the voice mail feature.

individuals receiving a call they cannot answer due to a meeting can send an SMS message and thus inform the caller that they will return the call after the meeting. Voice mail is used rarely and usually only when the responder is not available. However, it is used more often than SMS.

Conferencing technologies

Synchronous conference technologies are used when a task requires synchronous communication between several professionals working in different locations. The core team is normally sitting face-to-face and professionals over a distance take part in the meeting through electronic means.

Of conferencing technologies, teleconference is used most often. It is used on average several times a month and in some teams several times a week. Some teams have teleconferences regularly, for instance once a week. According to the informants, one of the main reasons for the popularity and prevalence of teleconference is that the technology is well known and easy to use. Video conferencing, on the other hand, is one of the least popular communication media in KONE GIS. A videoconference requires a special set of devices and rooms. According to an informant, there are not enough videoconference facilities available. Some of the supervisors considered video conferencing old-fashioned and expected it to pass away in the near future. “Why would we need video conferencing when web conferencing has the same features plus much more.”

Web conference is used several times a month and in some teams more than once a week. KONE uses software enabling the distribution of sound, images and documents (such as Microsoft Power Point presentations) via the information network. With a microphone, headphones and a computer connected to the Internet, any KONE employee can take part in a conference. Virtual presence can be made more realistic with real-time video feed, which demands a web camera in addition to the instruments mentioned above. Since the software also has a recording feature, people not present in the conference can watch it afterwards. The use of web conferencing is constantly increasing in KONE Corporation and the company is putting in a lot of effort to support the progress. Today, the use totals over 1,000,000 minutes a year. In the interviews the

technology received praise, but the delay, the quality of sound and video feed were not satisfactory. Consequently, data and telephone conference technologies are often used side by side, since telephone connection enables better sound quality and a shorter delay. Therefore, comparison between the use of teleconferencing and web conferencing may be difficult to make.

In general, meetings or conferences through technological means were considered very challenging. The probability of failure is great if members of the team have not prepared thoroughly. As was mentioned earlier, communication through technology is very fact-oriented. Therefore it is expected that people taking part in the meeting be well familiarized with the issues on the agenda. When team members are prepared and the meeting is well structured, the conference has a good chance of succeeding. The director of the meeting has an especially important role. Similarly to a face-to-face meeting, the director of the assembly can “activate” the members by asking their opinions and throwing in ideas for conversation. The democracy of the conference depends on the skills of the director. The supervisor is also responsible for monitoring the virtual presence of the members. There were even examples of incidences where members had “fled” from their computers in the middle of a web conference. It is also essential for the supervisor and other team members to be familiar with the conference technology in question. Especially when learning to use new technology, people are often insecure and more focused on the instruments than on the issue at hand. In addition to being familiar with conference procedures, all members of dispersed teams must be able to use the tools effectively.

6.4.3 Selection of communication medias

As already discussed virtual teams of KONE GIS have several communication technologies in use. Each technology was said to have a certain area of communication in which it is the most functional. Still, different technologies can often be replacements for each other. Choice of the most suitable communication media relies much on previous experiences. KONE as a company does not have a procedure for using particular communication medias for particular uses. Thus, it is obvious that different opinions are numerous. Formats of communication used depend largely upon the likings

of the senders and receivers of the messages. “Some people are easier to communicate with via e-mail than telephone.” Moreover, cultural patterns affect the choice of communication medias, and thus collaboration becomes even more complex.

Ways of communicating may alternate as the virtual teamwork progresses. Choosing the most appropriate communication medias is typically the most difficult in the beginning of a project and also when a new technology is introduced. Experienced members of virtual teams reportedly take other team members into account better. Moreover, in addition to finding the appropriate tools, the quality of communication gradually improves as the team continues to operate.

Most of the interviewees had made an oral agreement with their teams at the beginning of the projects about the uses of communication technologies. An agreement may include, for instance, a policy for uses of particular communication medias. “In our team you don’t have to read the e-mail if a team member has put you to the CC²⁸⁹ field.” In addition, the agreement may apply to the documentation standards or document version management.

6.4.4 Evolving technology

Informants were pleased with the fact that the development of technological instruments has brought new alternatives for virtual team collaboration. Nevertheless, the constantly evolving information and communication technology is a challenge for virtual teams in itself. Employees must get accustomed to new technology as quickly as possible and master several different communication devices. Nevertheless, virtual teams in KONE GIS were seen as early adopters of new communication technologies since their tasks concern new technology.

²⁸⁹ The CC in an e-mail application stands for “Carbon Copy.”

6.5 Effectiveness of virtual teamwork

According to the informants, the performance level in virtual teams pales in comparison to conventional ones. “Without development, virtual teams may turn back to conventional ones in only a few years.”

6.5.1 Performance of virtual teams

There were different opinions on the effectiveness of virtual teamwork in relation to conventional teamwork. Some of the interviewees thought that communication through technology is even more effective than the ways of conventional teams. Projects are planned more thoroughly and resources are used more effectively in a dispersed work environment. For instance, KONE GIS is testing global software, which offers tools for controlling many tasks and projects simultaneously. It has also been noticed that communication through technology is very clear and factual. “Whereas in a spontaneous face-to-face discussion people “throw around” half finished ideas, people communicating through technology have first thought things through carefully.” Before virtual team members send assignments to colleagues over the e-mail, they most likely take a relatively good time in preparing the message by reading it through, estimating its intelligibility and rewriting it. According to supervisors, a virtual environment demands short and simple messages, which reduce the risk of the receiver interpreting them wrong. On the other hand, the receivers might end up in situations where they neither understand the messages nor have a chance to ask quick specifying questions about them. Moreover, communications through technological means, such as web, video or teleconferences, were very fact-oriented in comparison to a traditional face-to-face meeting.

On the other hand, some of the supervisors said that virtual teamwork is less or much less productive than conventional work. The typical answer was: “It is less effective in terms of ease of getting the work done. It is more effective in terms of saving travel time and costs.” Supervisors often saw collaboration effectiveness to be a matter of team assembling. “Some people need a lot of handholding whereas others do not. For people

needing guidance, face-to-face teamwork is a better option.” In general, virtual team supervisors thought that becoming a virtual organization immediately caused a deep depression. “The performance of KONE GIS has been at a poor level”. Nevertheless, the supervisors believed the performance level trend to be improving while they disagreed on whether the performance level will ever reach the height at which it was before organization change. The following figure (Figure 13) was sketched with one of the informants interviewed face-to-face.

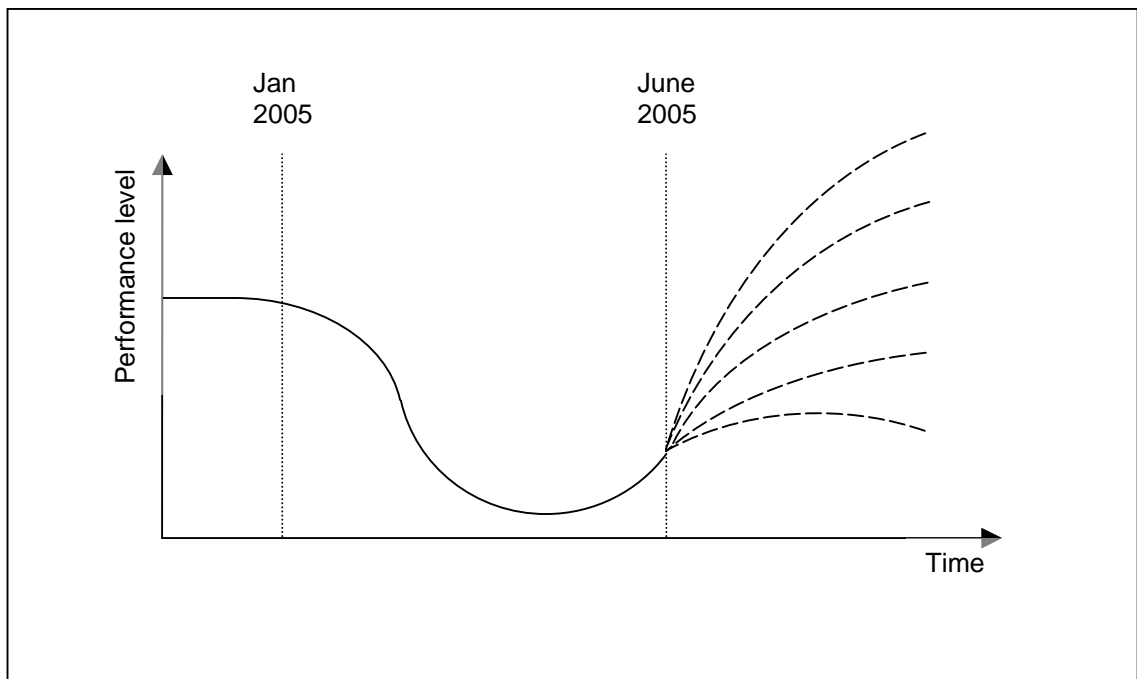


Figure 13. Estimated KONE GIS performance curve.

6.5.2 Need for training and development

Supervisors stated that there is a need for training and development in virtual teams in KONE GIS. According to them, the need is greatest at the beginning of a virtual project or teamwork. The development ideas can be roughly divided into three categories:

- Working in virtual teams training
- Leadership in virtual teams training
- The use of communication medias in virtual teams training

Currently, the training focuses most on new communication technologies. The informants would rather have training concerning the “people side” of the work. “It is more important to understand how to communicate than which technologies to use. We should be taught the different ways people “receive” information, cultural awareness, phone etiquette, and reading people without seeing their faces... only after that should we move on to technology.” Virtual employees need to understand their work environment in order to communicate and collaborate more efficiently. Methods observed to be suitable in a conventional work environment might not function when team members are working remotely. In addition to increasing awareness, supervisors would like to offer proper “tools” for working in virtual teams.

Furthermore, the informants would like to know more about leading people in virtual teams: how to organize and control work as well as how to create commitment and trust among virtual team members, for instance. Currently, leaders achieve their knowledge on virtual team leadership mainly through their own experiences. The best practices are not taught; a fact that may keep virtual teams falling into the same pitfalls over and over again. Moreover, some of the informants mentioned their interest on how to create optimal virtual teams. What kind of complementary skills should members have in order to create the best entirety?

“There is always the need to teach employees how to use communication medias effectively.” In KONE GIS, employees are quite familiar with the latest technologies due to the nature of their work. Nevertheless, skills vary a lot. In addition to being familiar with different communication means, virtual team members should know what kind of messages to use in particular means of technology and which media to use in particular kinds of situations. Operational agreement, as discussed earlier, is a practical way to reach a consensus on the use of communication medias. However, awareness should be developed further in order to deliver better results.

7 CONCLUSIONS

This concluding chapter of the study will summarize the major findings under the dimensions of virtual work introduced in the sub-chapter 2.2.1. Implications from the managerial point of view will also be presented, followed by suggestions for further research.

7.1 Main findings and managerial implications

The purpose of this Master's Thesis was to describe the challenges in developing virtual teams at KONE Corporation and especially in KONE Global Information Services organization within it. The challenges consist of both the negative and the positive elements affecting virtual teamwork. The main research question guiding this study was as follows:

- What kinds of challenges may a virtual team face in the developing stage?

The main research question was further divided into the following sub-questions:

- What kinds of challenges caused by working in different places may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by mobile way of work may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by different time zones may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by the nature of temporariness may a virtual team face, especially in the developing stage?
- What kinds of challenges caused by the diversity of team members may a virtual team face, especially in the developing stage?

- What kinds of challenges caused by modes of interaction may a virtual team face, especially in the developing stage?

The sub-questions arose from a theoretical framework²⁹⁰ used in this study presented in the sub-chapter 2.2.1. The study did not focus on management and leadership in virtual teams. To understand virtual teams better, some of the challenges were discussed in the leadership and management point of view as well.

At first, relevant literature of the field was reviewed. A theoretical framework was then drawn up to summarize the major issues surrounding the area of study. To test the applicability of the theoretical framework and to find the particular challenges in developing virtual teams at KONE Global Information Services organization, an empirical study was conducted (see the figure 14). The method chosen for data collection was a qualitative research including survey and in-depth interviews with virtual team leaders of case organization. This method was chosen as it allows for an extensive amount of data to be revised in a relatively short period of time, thus providing a possibility for deeper analysis.

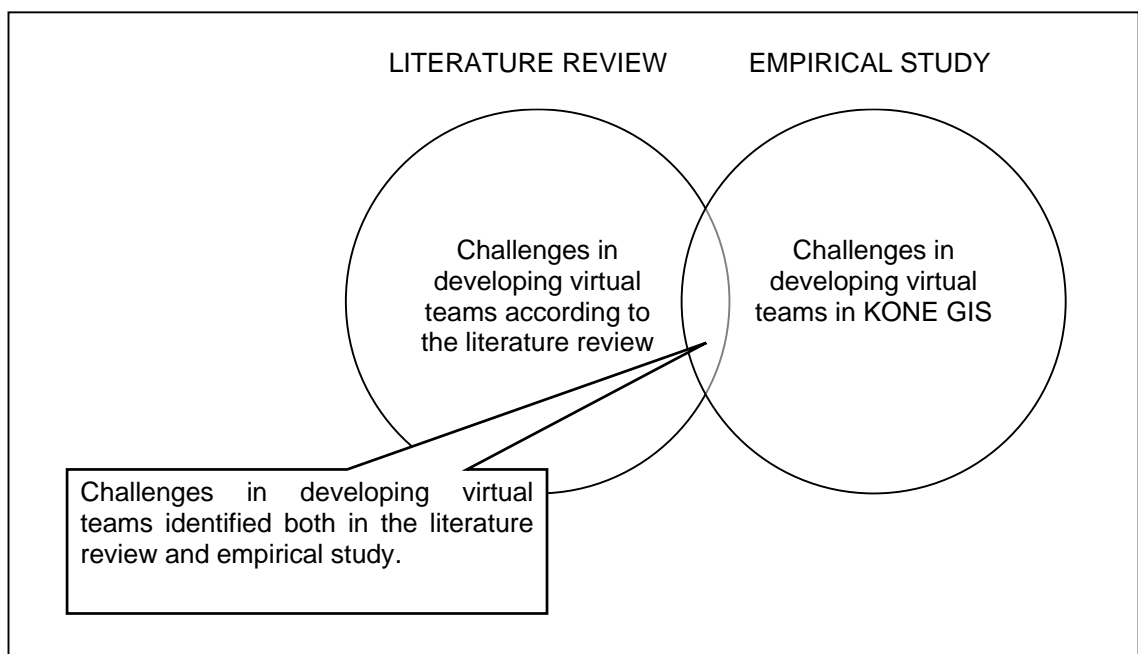


Figure 14. Interdependency of the literature review and the empirical study.

²⁹⁰ Vartiainen, Kokko & Hakonen 2004a, 20–22.

Overall, the theoretical framework of the study arising from the model of dimensions of virtual teamwork seemed to be suitable for studying challenges in virtual teams. The challenges found in the empirical study fit under the four dimensions well.

The empirical findings are in line with those in the literature review. Thus, teams in KONE GIS face typical challenges in virtual teamwork. As in the literature, leadership in virtual teams was said to be in key role in pursuing good results. Finally, the conclusions are drawn and grouped as earlier – under the themes derived from the model of virtual teamwork.

7.1.1 Place

The virtual teams in KONE GIS are highly dispersed by place. Each team leader surveyed and interviewed represents a team with members working in separate countries and even continents. 16 different countries were mentioned altogether. Some of the virtual teams in KONE GIS are quite equally dispersed while some, as in the literature, unequally dispersed, so that there is a core team working in one location while the other members are working remotely²⁹¹. The method of organizing workforce depends on the tasks the team is working with.

In Allen's²⁹² study, once people got more than ten meters apart, the likelihood of their communication at least once a week dropped below 5 %. When the proximity increased from 30 meters to 3000 kilometers, there were no significant differences in the degree of communication²⁹³. Based on this study, virtual employees working in a core team communicate much more than those working dispersed. Virtual team leaders should pay attention to this in order to increase the quality of teamwork.

One of the presumptions was that lack of awareness and the feeling of isolation from others have a negative impact on working²⁹⁴. Interaction enabled by the common work place makes it possible to share real time knowledge on the activities of others, such as

²⁹¹ Clutterbuck 2004, 25.

²⁹² Allen 1977.

²⁹³ Vartiainen, Kokko & Hakonen 2004a, 39.

²⁹⁴ Vartiainen, Kokko & Hakonen 2004a, 42.

their locations and intentions²⁹⁵. Corresponding to the literature, leaders in KONE GIS said that in virtual work environment many problems arise from lack of togetherness. Virtual employees may experience, for instance, sense of isolation, especially the peripheral members of the team²⁹⁶. However, people react differently to isolation. Commitment towards work may also shake when the coworkers are not present²⁹⁷. To create and maintain a feeling of togetherness²⁹⁸, virtual team leaders prefer meeting face-to-face frequently or at least in the beginning of virtual teamwork or project. Moreover, togetherness can be improved by creating the right atmosphere as well as over communicating.

As in the literature, gaining trust was challenging as well as essential in virtual work environments²⁹⁹. Since it is impossible for directors to be constantly supervising their subordinates working on different locations, they simply have to trust in their employees' abilities to perform their tasks. According to Fernandez³⁰⁰, an atmosphere of trust in a virtual team enhances open communication, improves cooperation, decreases unawareness, creates collective understanding and improves costs controlling. The virtual team leader is in the key role when creating trust among the team members³⁰¹ in every stage of a developing virtual team³⁰². In KONE GIS this is mainly done by bringing the team members together either face-to-face or through communication medias.

Unlike in the theoretical part, mobile way of work was not discussed in the empirical study. The interviewees did not think of their team members as mobile workers. Therefore no conclusions on the mobile way of work are drawn here.

²⁹⁵ Vartiainen, Kokko & Hakonen 2004a, 42.

²⁹⁶ Connaughton & Daly 2004, 119.

²⁹⁷ Connaughton & Daly 2004, 119.

²⁹⁸ Connaughton & Daly 2004, 119.

²⁹⁹ Fisher & Fisher 2001, 96; Lipnack & Stamps 2000, 19.

³⁰⁰ Fernandez 2004, 50.

³⁰¹ Clutterbuck 2004, 27.

³⁰² Clutterbuck 2004, 27.

7.1.2 Time

Corresponding to the literature review, working across time zones is demanding in virtual teams of KONE GIS³⁰³. Difficulties with time zone differences emerge especially when the activities throughout the world must be synchronized³⁰⁴. As has been studied, simultaneous work crossing more than six time zones already causes remarkable problems³⁰⁵. As a consequence of asynchronism, virtual employees have to flex with their working hours. For instance, telephone conferences between the virtual team members in Belgium and in China are organized Belgian time early in the morning, while telephone conferences between Belgium and the United States are late in the evening. Nevertheless, members of virtual teams gradually get accustomed to an asynchronic work environment. The problems arise mostly in the early stage of virtual teamwork³⁰⁶.

KONE GIS also benefits from time zone differences, because they can recycle tasks from one time zone to another, and hence the working day of 24-hours can be achieved³⁰⁷. This is quite common in teams working with issues demanding little supervision and expertise. For instance, the e-mail traffic is controlled from three locations dispersed equally throughout the world. Occasionally, more demanding development tasks may be recycled as well. In every case, recycling the tasks requires effective time management³⁰⁸.

Part of the virtual teams of KONE GIS, especially the teams working with development tasks, does project work. As project work is by nature temporary, the team assembly may change from time to time. Unlike in theory, the turnover of virtual team members is not notable in KONE GIS³⁰⁹. On the other hand, KONE GIS was established only few months prior to the conduct of this study, and hence the team assemblies may have

³⁰³ Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

³⁰⁴ Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

³⁰⁵ Riopelle, Gluesing, Alcordo, Baba, Britt, McKether, Monplaisir, Horn Ratner & Harris Wagner 2003, 263.

³⁰⁶ Vinaja 2003, 341.

³⁰⁷ Vartiainen, Kokko & Hakonen 2004a, 45.

³⁰⁸ Vinaja 2003, 341.

³⁰⁹ Vartiainen, Kokko & Hakonen 2004a, 45.

stayed the same. In these circumstances, making a conclusion concerning the turnovers' impact on issues such as team spirit or innovativeness is not reasonable.

Remarkably, adapting to new organizational structures and new teams is not easy for those who end up sitting next to former colleagues. Especially in Brussels, where numerous KONE GIS employees work, this has caused major problems.

7.1.3 Diversity

As in Hofstede's³¹⁰ study, employees in KONE GIS representing different cultural backgrounds have particular patterns that affect cross-national communication and collaboration. People express things differently depending on their culture and therefore they may tend to misunderstand each other's behavior or stereotype people from other countries and hence come to distrust one another³¹¹. Thus, understanding cultural differences is essential for virtual team members³¹².

As mentioned in the literature, a team faces many kinds of problems in communicating and collaborating, especially in the beginning of a project³¹³. However, persons working in multicultural environments were said to adapt to a new way of working quite rapidly³¹⁴. Knowing that their peers represent different cultures, they can tolerate occasional cultural clashes. According to Duarte³¹⁵, in a unique team culture evolves as a mixture of all the different team members' national, organizational and functional cultures. This seems to be likely also for virtual teams in KONE GIS. Moreover, KONE has a long tradition of being a multicultural organization since it has been operating in many countries for decades. Therefore, it can be assumed that problems caused by cultural differences may be more emerging in less internationalized companies.

To create togetherness in a multicultural team, leaders strive to organize face-to-face meetings in the beginning of virtual teamwork in order to get members to know each

³¹⁰ Hofstede 1983, 106.

³¹¹ E.g. Lewis 1996.

³¹² Vinaja 2003, 342; Sookman 2004, 91; Lewis 1996.

³¹³ E.g. Lipnack & Stamps 2000, 66; Vartiainen, Kokko & Hakonen 2004a, 46.

³¹⁴ Duarte 1999, 55.

³¹⁵ Duarte 1999, 55.

other in person. In addition, they try to communicate with team members as much as possible. As a whole, the leader is in the key role when creating togetherness in a multicultural work environment³¹⁶.

In order to communicate, virtual teams have to agree upon a common language³¹⁷. The official language for KONE Corporation is English and therefore multilingual virtual teams of KONE GIS use the language for written as well as oral communication. Even though the members of a team may be more fluent in another language, using English is important for documentation and knowledge sharing, which may improve, for instance, innovativeness. According to the survey and interviews, the language barrier was said to be highest in the beginning of virtual teamwork and when working on difficult tasks. In addition, understanding the accents of Chinese and Indian people was said to be difficult. Even though according to the literature misunderstandings in multi-lingual teams are ordinary³¹⁸, KONE GIS had not suffered from serious misunderstandings. In all, the language barrier in KONE GIS has lowered since the organization was established.

In order to avoid problems in multilingual communication, it was proposed that the language skills of individuals are taken into account when composing a team.³¹⁹ The differences in language skills of KONE GIS employees are quite big. Nevertheless, the company could promote the language learning of the employees by placing them into multilingual teams, which might lead to more collaboration in the whole organization as the collective language use develops.

Due to different cultural and lingual backgrounds of employees, establishing a common way of working may be problematic in virtual teams. Nevertheless, again corresponding to the literature, a virtual team can be very innovative and creative at its best³²⁰. This is due to the different viewpoints of the members. However, according to virtual team

³¹⁶ E.g. Lewis 1996; Vartiainen, Kokko & Hakonen 2004a, 46; 72–73.

³¹⁷ Vinaja 2003, 342.

³¹⁸ Riopelle, Gluesing, Alcorido, Baba, Britt, McKether, Monplaisir, Horn Ratner & Harris Wagner 2003, 246.

³¹⁹ Vinaja 2003, 342.

³²⁰ Vartiainen, Kokko & Hakonen 2004a, 46.

leaders, differences in people do not automatically bear innovativeness. Therefore the supervisor has a central position as a creator of an atmosphere of innovativeness.

7.1.4 Mode of interaction

Virtual teams of KONE GIS have several communication medias in use. Thus, selecting the best technology for a particular situation is very challenging. In line with the theory, selection depends mostly on the information richness³²¹ and presence of nonverbal cues required³²². Former experiences and cultural issues also shape individuals' preferences. As time goes by, a suitable way of communication develops for a team. To improve the effectiveness of communication and collaboration, virtual teams should be supported to find a common way in a relatively early stage of virtual teamwork. The use and challenges of the most often preferred communication medias are presented next.

According to the virtual team leaders of KONE GIS, face-to-face communication is needed most when the tasks are complex and require rich communication³²³. Munter³²⁴ has listed situations where face-to-face meetings are appropriate: (1) when rich nonverbal cues including body, voice and proximity are needed; (2) when the issues are especially sensitive; (3) when the participants do not know one another; (4) when establishing group relationships are crucial; and (5) when the participants can be in the same place at the same time. On the basis of this study, face-to-face meetings are used (1) in the beginning of a virtual project; (2) when the task is complex; (3) when giving feedback; (4) when creating team spirit and commitment; and (5) in "human resource management related discussions" between the team leader and a subordinate. Overall, face-to-face meetings in KONE GIS are organized in similar situations as identified in the literature.

E-mail is clearly the most popular mode of interaction. According to the literature, the capacity of e-mail to carry information is very modest³²⁵. The informants, though, saw

³²¹ Daft & Lengel 1986.

³²² Baltes, Dickson, Sherman, Bauer & LaGanke 2002 in Wainfan & Davis 2004, 5.

³²³ Daft & Lengel 1986; Vartiainen, Kokko & Hakonen 2004a, 48; Hill 2003, 105.

³²⁴ Munter 1998.

³²⁵ Daft & Lengel 1986; Baltes, Dickson, Sherman, Bauer & LaGanke 2002 in Wainfan & Davis 2004, 5.

this as an advantage. When the messages are short they also are likely to be precise, which leads to effective action. However, overload of information in e-mail traffic creates frustration and hence virtual teams should not lean too much on e-mail.

Conferencing technologies aroused relatively much discussion with the informants. They commented that conferencing technologies are used each time rich information needs to be transferred and several participants should be on the same page at the same time³²⁶. According to the theories³²⁷ these means can transfer relatively much nonverbal cues. The theories argue videoconferencing to be most face-to-face-like. Nevertheless, in KONE GIS videoconferencing is used only once a month or slightly more. A videoconference requires a special set of devices and rooms while virtual employees can easily participate in web and teleconferences almost anywhere. Teleconferencing is still the most popular form of virtual conferencing, but as the technology develops the use of web conferencing may take the lead in the near future. Using conferencing technologies is challenging for many reasons. After the technological problems are overcome³²⁸, issues such as how to lead a meeting through technological means remain. Virtual meetings were repeatedly described as ineffective. However, a virtual conference may at its best be even more effective than a face-to-face meeting. The conference leader should have an ability to create a believable “virtual presence” among team members.

Constantly evolving technology also challenges virtual teamwork. Employees must get accustomed to new technology as quickly as possible and master several different communication devices. In all, informants were pleased with the fact that the development of technological instruments has brought new alternatives for virtual team collaboration³²⁹. Unlike in theory, resistance towards the technological change in KONE GIS was not remarkable³³⁰. This is understandable since the KONE GIS members are technologically orientated because of their line of work.

³²⁶ Lipnack & Stamps 2000, 209.

³²⁷ Daft & Lengel 1986; Baltes, Dickson, Sherman, Bauer & LaGanke 2002; Wainfan & Davis 2004, 5.

³²⁸ Kimble, Li & Barlow 2000.

³²⁹ E.g. Lipnack & Stamps 2000; Vartiainen, Kokko & Hakonen 2004a.

³³⁰ Kimble, Li & Barlow 2000.

7.2 Suggestions for further research

Combining an extensive quantitative element with the existing qualitative results would have enabled the author to draw definitive conclusions and more universally applicable implications, especially if virtual teams from various organizations within KONE had been included. Other relevant areas of further study are described below.

There are several possibilities to further probe and develop this research, either retaining the research question and problem at hand or changing them slightly. Firstly, this research can be extended to include other units of KONE Corporation, and furthermore, other companies. Secondly, this research can be developed into a more profound and elaborate study to go further in-depth into the very nature of virtual team processes.

This study focuses on identifying the challenges in developing virtual teams and, to some extent, discussing the managerial implications. It would be relevant to research in more depth how virtual team managers should respond to the challenges identified in this study. As has been mentioned, the manager's role in a virtual work environment is crucial and he or she has a great impact on teamwork.

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APPENDICES

APPENDIX 1: Web-based survey questionnaire

YOUR PERSONAL BACKGROUND INFORMATION

- Last name
- First name
- Gender
- Nationality
- Job title
- Business unit and country

YOUR VIRTUAL TEAM BACKGROUND INFORMATION

- When was the team established?
- What are the goals and tasks of your team?
- Size and structure of the team

WAYS OF COMMUNICATION IN YOUR VIRTUAL TEAM

- Please, estimate by which intensity your team members communicate with each other on average by the following ways? (Every of the ways had an dropdown menu with the following variables: several times a day, several times a week, several times a month, once a month, or less.)
 - Face-to-face
 - Phone
 - SMS (Text messaging)
 - e-mail
 - Web conferencing (Centra Symposium)
 - Videoconferencing

- Teleconferencing
 - Post
 - Voice mail
 - Collaborative software e.g.
 - Other 1 (Please, specify)
 - Other 2 (Please, specify)
 - Other 3 (Please, specify)
- In what kind of situations do you use the kinds of technology you selected above and why? Please, give two examples of the most and least used technologies.
 - In what kind of situations does your team provide face-to-face meetings? Why?
 - Is virtual communication more effective or less effective than face-to-face communication? Why?
 - Do you see need for improving virtual communication in your team? Please, provide suggestions.

CHALLENGES OF YOUR VIRTUAL TEAM

- As a work method, what disadvantages does virtual working cause for your team in terms of communication and collaboration?
- As a work method, what advantages virtual working provide for your team in terms of communication and collaboration?
- What issues emerge most often in the very beginning of a virtual project?
- How does virtuality influence your daily work as a team leader? How does it differ from being a team leader in conventional work environment?

APPENDIX 2: Semi-standardized interview

PLACE

- What is the most important benefit of being dispersed for your team?
- Have any of your virtual team members had a feel of isolation due to the dispersion?

- As a leader, how do you make it possible to pay attention to the distributed team members equally?
- How do you create team spirit and commitment in your virtual team?
- How do you handle lack of trust in your virtual team?

TIME

- How does working in different time zones impact on collaboration and communication?
- Does your team circulate tasks from a time zone to another in order to achieve combined working days?
- Does your team have a high turnover of employees? If yes, what kind of an effect does the change of a team member have on virtual teamwork?

DIVERISTY

- How does the diversity of individuals impact on virtual teamwork?
- Comment, how do the following issues affect the collaboration effectiveness?
 - Different cultures, languages, religions, values, experiences, educational backgrounds, ages, genders...
- Has your virtual team had cultural collision?
- How do you create team spirit and commitment in multicultural work environment?

MODE OF INTERACTION

- When is face-to-face meeting needed? How often does your team meet face-to-face?
- How does mediated communication impact on creativeness and innovativeness?
- Is decision making effective or ineffective in virtual work environment?
- Does the expertise of each team member become visible in your virtual team? (Is mediated communication democratic?)
- How do you give daily feedback through communication medias?

- Does your team have an operational agreement on the use of different communication medias?

CONCLUSION

- What are the three most important issues that should be developed in the next 9 months?
- As a whole, is virtual teamwork more or less effective than conventional teamwork?