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**KEY CHALLENGES OF NEW
AND SMALL VIRTUAL TEAM**

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ABSTRACT

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The purpose of this thesis is to study the factors must be noticed when building a new and small virtual team. These virtual teams are groups of people who work together without the boundaries of time or space using technology (Lipnack & Stamps 2000, 18). The main goal is to study in detail some of the common challenges faced when working with the small virtual teams, especially in the early stages of team development.

With this study and the results of it, the reader is aware of the challenges of virtual teams and the differences and similarities between traditional and virtual teams. In addition the reader knows also some factors that must be noticed when a new small virtual team is supposed to be created.

Based on a literature about the subject a framework for the challenges of the virtual teams is created. With a case study the framework is studied in more detail.

KEYWORDS: virtual teams, small groups, team work, challenges, communication, key elements

TIIVISTELMÄ

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Pro Gradu -tutkielma

Tämän tutkielman tarkoituksena on tutkia virtuaalitiimejä ja erityisesti pieniin virtuaalitiimeihin liittyvää ympäristöä. Virtuaalitiimeillä tarkoitetaan tiimejä, jotka työskentelevät yhdessä yhteisen päämäärän saavuttamiseksi käyttäen teknologisia apuvälineitä ylittäen ajan, paikan ja organisaatorajojen asettamat rajoitteet (Lipnack & Stamps 2000, 18). Tutkimuksen kohteena ovat erityisesti pienten virtuaalitiimien haasteet tiimin muodostuksen ja historian alkuvaiheissa.

Tutkielman tavoitteena on antaa lukijalle käsitys virtuaalitiimien luonteista sekä niiden haasteista. Tutkielmassa käydään läpi mm. perinteisten ja virtuaalitiimien eroja ja yhtäläisyyksiä, sekä muita tekijöitä, joilla on päällekkäisyyksiä virtuaalitiimien kanssa (kuten ulkoistaminen).

Tutkielmassa luodaan kirjallisuuteen perustuva viitekehys virtuaalitiimien yleisimmistä ja merkittävimmistä haasteista. Viitekehukseen on valittu muutama merkittävä haaste, joiden merkitystä pyritään arvioimaan tarkemmin Case-tutkimuksen avulla. Tutkielman Case-tiimi on pieni virtuaalitiimi, joka toimii yli ajan ja paikan rajojen.

AVAINSANAT: virtuaalitiimit, pienryhmät, ryhmätyö, haasteet, viestintä, avaintekijät

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1 INTRODUCTION

Present day business environment is not only affected by high-tech equipment, but also ran with it. Usually organizations cannot foster success without the technological dimension of doing business. Networks of computers, emails, voice mails, intranets, extranets, instant messaging, video conferences, virtual reality, and combinations of these, like Groupware software (software to support group work) and Computer Supported Cooperative Work (CSCWs) are some examples that Grenier & Metes (1995, 117-129) list in his book to explain the technology that affects the modern way of working.

Lipnack & Stamps (2000, 28) cover the essentials of networks and technology explaining that networks have taken over the whole world and brought everyone together. And due these networks new ways of doing business have emerged. Limits of space and time constraints are crossed as well as the boundaries of organization limits.

Since the very beginning of human history people have worked in teams. From hunting wild animals to designing complex software people have worked and are working in teams, Lipnack & Stamps (2000, 59-61) describe the nature of teamwork.

With the joint world the features of team work have been reset. Team members do not have to be in the same place in the same time anymore. Phone calls emails and instant messaging tools, for example, can join people from different countries and continent together without any delay in communication. These and other asynchronous tools (e.g. bulletin boards) give people an opportunity to communicate fluently even if the communication is not instantaneous. (Powell et al. 2004, 12).

Lipnack & Stamps(2000, 173) tell that though tools and methods of successful virtual team work exist, they do not foster success itself. As team work in general, also virtual teams face the challenges and restrictions caused by people and their roles. Karolak (1998, 16) tells that these challenges, however, can be won and many advantages can be achieved.

Virtual team advantages

Evidence from other studies and articles (e.g. Hoover 2002; Powell et al. 2004; Grenier & Metes 1995; Karolak 1998; Mowshowitz 1997) indicate that organizations can gain remarkable benefits from virtual teams. This, of course, can happen only if virtual teams are successfully built. Lipnack & Stamps (2000, 70) put it simple by stating: A poorly built virtual team can even decrease the efficiency of the organization. No doubt, this is true. However it is also true when building any kind of team: poor team is not likely to succeed.

In contrast Karolak (1998, 16) tells that successfully built and managed virtual team can bring benefits to organisation in many areas. Improvement can happen for example in productivity, personnel, and in processes. Karolak (1998, 16) also mentions that costs like labour costs and overhead costs can be decreased too.

Hoover (2002, 13) tells that the improvement of productivity can be lead, for example, from decreased time of phone call processed or decreased effort in information searching.

As said, virtual teams can improve processes as well. "Profitability is also dependent on efficient and effective processes for getting work accomplished, and teamwork offers improvements there as well", Hoover (2002, 14) says.

Technology also enables dynamic services, Mowshowitz (1997, 33) tells. Certain jobs, earlier done by a human being, can be automated and transformed into dynamic services which respond immediately to any task requested. And by

that improve processes making them faster and more efficient. It is the technology which enables the virtual teams too (Powell et al. 2004, 6).

According to Hoover (2002, 15) team work provides motivation as team members have the same goal and are committed to it. Mutual responsibility and interdependency of other team members bring motivation as well. This is naturally true also in the traditional teams, not only in virtual teams.

Mowshowitz (1997, 37) tells that the effects are not always very visible. Virtual teams may not always have direct effect on one's work or to the things one is originally hired to do, he says and gives an example: Virtuality can provide assistance on completing some unrelated tasks as sending list of working hours to supervisor. This, in contrast, can lead to a raised motivation and productivity.

Karolak tells in his book *Global Software Development* (1998, 16) that with virtual organizations and teams costs can be reduced. As technology allows people to work together from distance and people can represent many cultures and countries, fixed costs and labour costs can be reduced.

As members of the team or organization can perform their tasks from smaller offices or even directly from home, investments in offices and production spaces are smaller, Karolak (1998, 16) tells. Also, virtual teams can work in virtual environment as traditional team requires facilities to work in.

As described, many advantages can be achieved with virtual teams if they are successfully built. Many challenges are already noticed and explained in the literature about virtual teams. The aim of this study is to notice some of these essential challenges that virtual teams face when they are built. The research question of this study is following:

- What factors may cause a challenge when building a small virtual team?

To answer the question this study generates a framework about the challenges of virtual teams. The framework is based on the literature written about the subject in the past years. The framework describes the challenges in a clear table format to give the reader a general view about the subject in one eye sight.

This study goes forward through definitions and basics of virtual teams to the challenges of them. Chapter 2 Virtual Teams brings down the discussed elements in its summary with a table which summarizes the elements of the chapter and reflects the same elements with the Case team of this study.

Chapter 3 Virtual Team Challenges focuses on the challenges usually mentioned in the area of virtual teams. These challenges are the main challenges chosen for this study and to its framework.

Based on the two first main chapters (2 Virtual Teams and 3 Virtual Team Challenges) the framework is generated. The framework contains the main challenges and presents them in a clear table format. The framework summarizes the challenges in general level of virtual teams. The framework also contains a separate column for the Case study.

Case team and environment is shortly introduced in the chapter 4 Case: Servia Finland Ltd. Chapter describes the Case team of the study and briefly tells about the study and data collection method.

In chapter 5 the results of the interviews are studied and analyzed. The framework is filled in with the Case study material. All challenges are discussed in detail and the results of the interviews are demonstrated.

The last chapter is 6 Conclusions. This chapter makes some conclusions about the study results and proposes further study subjects.

2 VIRTUAL TEAMS

Think about teams, groups, networks, collaboration, and alliances. They all have a common feature of doing together. As people and organizations are distributed across the globe, new ways of working have been developed. Working in virtual teams is one of these new ways. This chapter explains the essentials of virtual teams and the affecting factors around it. Literature suggests that there is much to gain with help of virtual teams (Karolak 1998, 16). Because of this virtual teams are very interesting topic which is wanted to study in this thesis.

This chapter takes a look at the definitions, people working in virtual teams, communication, different forms of virtual teams, and the technology around the phenomenon. At the end of the chapter a summarizing table of the chapter is presented and it is reflected against the Case team of this study.

2.1 Definitions

This Definitions chapter recognizes and explains the most complex terms which are commonly misunderstood or have multiple meanings in the field of virtual teams. By understanding the terms explained the reader is supposed to be able to read and understand the study fully.

Virtual

The word “virtual” has its root in ancient Latin with the word “virtue”. The word has evolved quite much from the original meaning of personal goodness or power. With term virtual it is usually meant something that is “not real” or “appears to exist”, as well as “almost like”. Term virtual reality extends the meaning of virtual to larger scale. Computer-based systems that create places,

worlds and spaces without physical location are considered to be virtual. (Lipnack & Stamps 2000, 15-16).

Team

The word “team” is usually used in meaning of a group of people with a same interest, or same goals. The term “team” can be considered to be more than just a group. (Stewart et al. 1999, 3). Stewart sums it up together with the following:

“ A Team is a collection of individuals who exist within a larger social system such as an organization, who can be identified by themselves and others as a team[.]” (Stewart et al. 1999, 3).

This definition does not make any difference between differently oriented teams, like football team or team of IT-professionals. Many kind teams have been around from the earliest days of human history. In 1965 Tuckman created a model to describe the process of team formation (Hoover 2002, 60). Teams in general and working in teams were nothing new back then either. Before any literature about the subject and even before any written language was developed early hunters and gatherers had to team up to hunt down animals to eat or to harvest the edible treasures of nature. Many evolutionists believe that the human race has survived because they learned to team up (Stewart et al. 1999, 4). In the present day society teams are formed in several places and situations. The most basic form of human team, a family, can be considered as a team (Hoover 2003, 3). Sport teams, associations, political parties, etc. they all are teams. They all have the feature of common interest.

Team work has many advantages. When feeling belonging to a team one can feel relief knowing that one is not alone with all the workload and information processing. Within teams the team members can make their own decisions and feel control they need to cope with their lives and work. Hoover (2002, 8) points out that in her interviews made for her book *Effective Small Group and Team*

Communication the most frequently mentioned individual benefit from teamwork is the opportunity to enhance self esteem.

In addition to individual benefits there are also organizational advantages that can be gained from teamwork. Productivity, processes, and personnel advantages were shortly introduced in the chapter 1 Introduction.

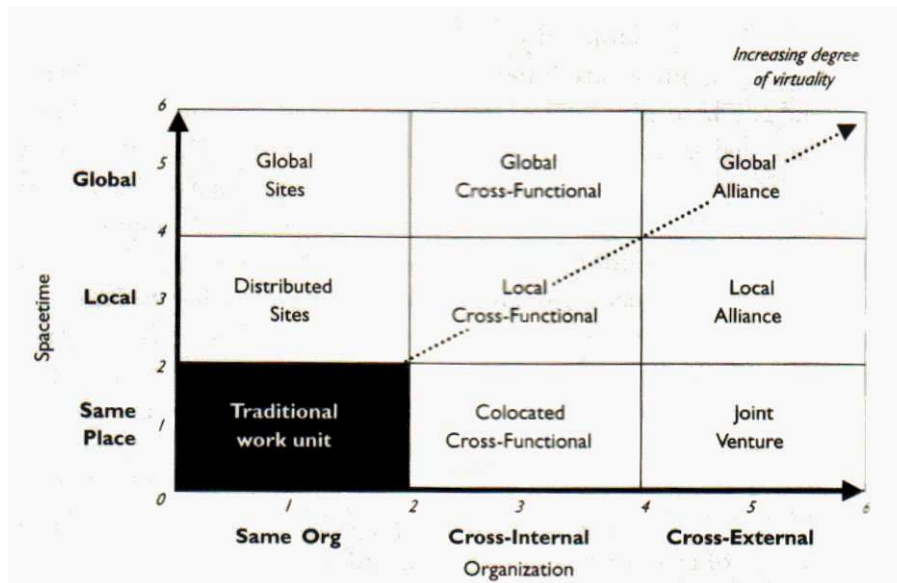
Teams in general and also small groups have been studied a lot from several perspectives like functional, temporal, psychodynamic, social networks and conflict-power-status perspectives (Poole & Hollingshead 2005, 1). As this study focuses more on the challenges of the virtual teams, these perspectives are not in the core interest of this study. The book *Theories of Small Groups* by Poole and Hollingshead can be recommended for further reading about these perspectives.

Virtual Team

With these “virtual” and “team” words combined we get a new term: Virtual Team. As this study focuses on virtual teams the according term must be explained in detail. Lipnack & Stamps (2000, 18) put the term together with phrase: “A virtual team is a group of people who work interdependently with a shared purpose across space, time, and organization boundaries using technology”. This means that the team consisting of individuals work apart together to gain the goals agreed among the team. Individuals in this kind of team can represent for example different organizations, different time zones, and different nations.

In practice these virtual teams are combinations of traditional and virtual working methods. Some virtual teams can be considered to be more virtual than others. Lipnack & Stamps present a chart of *Varieties of Virtuality* in their book *Virtual Teams*:

Table 2-1 Varieties of Virtuality (Lipnack & Stamps 2000, 62)



The Table 2-1 demonstrates the effect of organization limits and “spacetime”-factor on virtuality. The figure makes quite strong distinctions between the cells. To match the purpose of this study some of the terms in the figure must be built-down.

The more global and cross-organization the team is, the more virtual it can be considered. (Lipnack & Stamps 2000, 62). However, this does not mean that there could not be “full-blooded” virtual team within one organization

At the bottom left corner of the figure locates the traditional work unit. This is a unit where the workers are in the same place in the same time. When going upwards from the traditional work unit the space and time factors are different than in the traditional unit. At the top left are the global sites. These sites can be for example around the world located sales offices of a company which work together to gain more sales and to make the sales of the company more efficient. Also smaller teams can represent the style of global sites: for example, supervisors of different departments could make a global site styled team (but

could not be called as global site due the small number of team members and the scale of the team).

When going to right from the traditional work unit the boundaries of departments and organization are crossed. As from the chart can be seen, joint ventures can be cross-organizational units which work in the same place. This kind of venture could be for example an internet-café where one company is running the cafeteria and other the internet computers. In the context of this study a small team considering co-operation could represent this kind of joint venture.

When going to the top right corner a global alliance square points out. This means that the boundaries of space and time are crossed, as well as the boundaries of organizations. For example, a team formed from a software development organization from India and a global training organization from Finland which aims to make profit with selling software products and training could be considered as a global alliance.

The name global alliance suggests strongly that the team would be quite big and it would be working in a very large scale. However, a small cross-external and global virtual team would have all the same features as global alliance in the figure. The Case team represents a small cross-external and global virtual team, but could not be considered as global alliance due the small size of the team.

Virtual organization

A bit wider concept on the virtual business world is virtual organization. A virtual organization could be identified as a global alliance in Table 2-1. The difference between virtual teams and virtual organizations is in the business scale. As virtual teams tend to be task-focused teams with a determined goal, a virtual organization draws a more general outlines for the virtual business. As there are teams in organizations in “real business world” there are virtual teams

in virtual organization in the virtual business world. (Travica 2005, 46-47; Powell et al. 2004, 10).

Virtual teams vs. Traditional teams

Many facts and challenges concerning the traditional face-to-face teamwork affect also the virtual version of it. Motivation, trust issues and the ways of working are all aspects that must be noticed regardless which kind of team is used.

Previous studies have shown that groups using technology can work together through time and space constraints. In traditional teams group members must be in the same place, in the same time, in order to communicate. (McGrath & Hollingshead 1994, 4). This boundary of space and time constraint is won in virtual teams. The members of virtual teams can locate in different cities or even in different continents. It is the technology that diminishes the distance.

It is been discovered that trust develops and changes over time in traditional teams with the on-going interaction and experience of working together. In virtual teams, where space and time boundaries are crossed, establishing of trust can be harder as handshakes and face-to-face interactions are missing. (Kanawattanachai & Yoo 2002, 44). Paulsen (2004, 154) stresses that this puts pressure on team building and management. Trust must be achieved to gain satisfactory results in teamwork.

Which kind of team one should build when aiming to success is not an easy question to answer. Some evidence support virtual teams and other traditional teams. To illustrate this McGrath & Hollingshead (1994, 90) mention studies which have shown that: teams with computers are not as efficient as traditional teams; at least in the early stages of group history and with little experience in computing. He also tells that the groups with computers are not likely to reach consensus. But if they do, it will be higher than with traditional teams. This can

also be said other words: It is hard to build successful virtual team, but if one manages to put one together, it will be worth of the time and effort.

In review of current literature of virtual teams Powell et al. (2004, 10) point out yet one more distinguishing difference between traditional and virtual teams: Virtual teams tend to be more task-focused than traditional teams, which seem to be more social-focused. This can be explained partly with the fact that asynchronous communication methods and other virtual team communication tools are more task-oriented than traditional conversations and speeches are. After some time, however, the focus on task seems to lessen in virtual teams too.

Media/Medium

Communication tools are usually called as media or mediums. In some studies the technological communication methods are called modalities (Frey 2002, 286). In this study the terms media and medium are used in the same meaning.

The spread of the terms is wide. In this study terms media and mediums are used as a meaning of these technological communication methods and / or tools. The communication media and the tools are not, however, in the core interest of this study. There is plenty of written material about CSCW (Computer supported co-work) and other Group software. Chapter 2.5 Technology takes a glance to the technological issues concerning virtual teams and people of virtual teams.

Virtual Teams vs. Outsourcing

Virtual teams and outsourcing can be easily mixed. Especially cross-external virtual teams remind outsourcing of functions as the team members represent different organization and usually belong to different payroll.

Outsourcing of projects and processes to gain advantage in costs has been common practice for years in many industries. With outsourcing an

organization purchases services, earlier produced in-house, from another organization which offers the services with less total costs. In panel discussion of challenges of outsourcing and global development (Fraser et al. 2004, 146-147) Dave Thomas of Bedarra Research Labs was surprised by the late-coming of outsourcing to IT business: " Outsourcing to gain an advantage in labor costs has been standard practice for years in many industries". In same discussion panel Ron Crocker from Motorola had a strong opinion that outsourcing and distributed teams will be the key to the success in Motorola's business.

The key difference of virtual teams and outsourcing can be found from the viewpoint of effectiveness and costs. With outsourcing cutting costs seems to be the main reason to act, as in virtual teams increased effectiveness is the main goal. (Fraser et al. 2004, 145; Grenier & Metes 1995, 217).

Usually outsourced teams and virtual teams are both distributed teams they share the same challenges with communication, cultures, crossing boundaries, and trust, just to mention some. The major challenges of virtual teams are presented in Chapter 3 Virtual Team Challenges.

2.2 People in teams

As in all kinds of teams, also in virtual teams, people communicate and work together. People are different in many ways. They have different kind of personalities: they can be from different cultural or educational backgrounds, for example. Some trust other people more than other. In traditional teams all these differences can cause damage and/or advantage to a team. Same is with virtual teams.

According to Lee & Malone (1988, 22), in addition to personal differences, in virtual teams the differences in organizations and cultures must be noticed.

What is appropriate here might be forbidden elsewhere. One virtual team might contain an American customer, a Finnish software designer, an Indian coder and a French graphic designer. The distances between team members are great, and same is with the cultures; they can be far away from each others. In multi-cultural teams it is very important to find a common language to communicate, Lee & Malone (1988, 22) emphasize. The common language here doesn't just mean the language spoken, but also all the other communication related aspects, like the tools used on the communication. Culture related issues are discussed in more detail in chapter 3.6 Cultural differences

In traditional teams people communicate almost always by speaking to each other in the same room. Nonverbal gestures are interpreted usually correctly because of same cultural background (Lipnack & Stamps 2000, 66). According to Hoover (2002, 30), these nonverbal messages can be considered "as everything other than the words". This other means for example tone of voice, facial expression or some other body language. In virtual teams these nonverbal messages might not transfer with the messages. This must be noticed in the communication.

As people work together trust is an issue that needs attention. Before people work fully and in the most efficient way, trust must be built between them. Trust works as an enabler in cooperation and in situation where individuals have to work in uncertainty with ambiguous information (Panteli, 2005, online). Trust issues of virtual teams are discussed in more detail in chapter 3.4 Lack of Trust.

2.3 Communication process

In the year 2002 Hoover (2002, 23) quoted her old teacher by claiming that the communication is the very centre of life, emphasizing that through

communication everything else is created. All groups, virtual or not, have the common feature of communication, sharing and organizing information. Also drafting policies and procedures and decision making belongs to normal communication of all kinds of groups (Nunamaker et al. 1991, 41). DeSanctis & Gallupe (1987, 589) presented a foundation for the study of group decision support systems (GDSS) back in 1987. These GDSS systems are planned to support the decision making in groups. Before a group can make any decision communication must happen. One way to describe the simple one way communication process is the Shannon model (See Figure 2-1). In Shannon's model communication is a straight-forwarded process from information source to its destination.

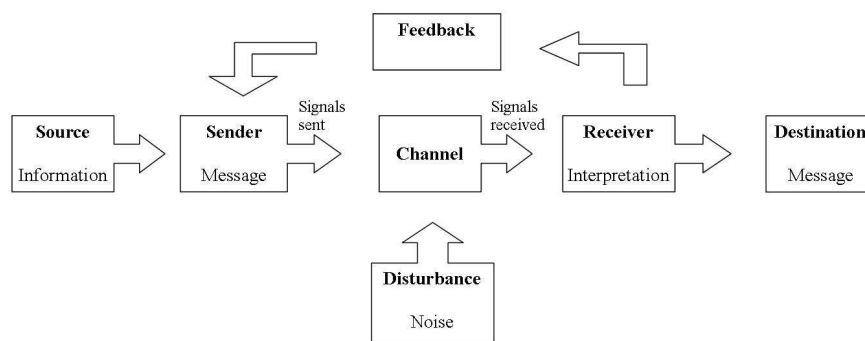


Figure 2-1 Shannon's (Interactive) Communication Model (1948)

In Shannon's model a message formed from information is sent through a channel to a receiver who interprets the message. The message can be disturbed on its way to its destination. Traffic noise can disturb the oral message sent by a person to another in cities (Shannon 1948, 2). Lag or loss of TCP packets can be disturbing factors in electronic messaging. After the message has reached its receiver and destination, the receiver can send feedback which actually happens just in the same way as the first message.

The model works fully in the case of traditional team communication and in virtual team communication. Whether the messages are delivered immediately or with delay, communication can be divided to synchronous and asynchronous communication. In synchronous communication, like speech or meeting, the message reaches its destination immediately, where as in asynchronous communication the message can be waiting its interpretation in someone's email inbox.

In group and team communication the process is more complex. The communication flows in multiple directions with unforeseen consequences. (Hoover 2002, 23) If we use the sender / receiver setup from Shannon's communication model to illustrate the complexity of team communication the figure contains many boxes and arrows (See Figure 2-2)

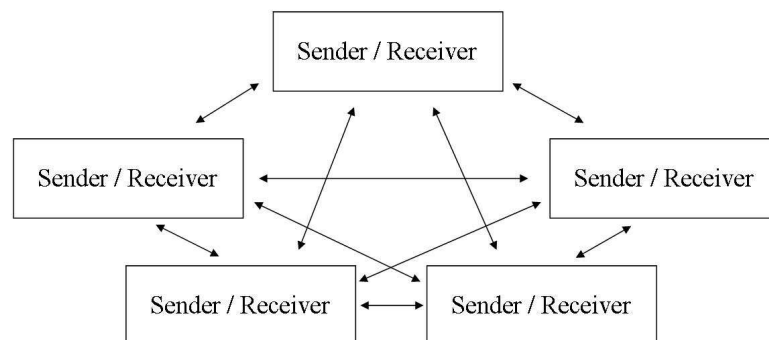


Figure 2-2 Team model of communication process (Hoover 2002, 23)

When imaging adding in the communication interfaces and channels (like chalkboards, notebooks, phones, computers, emails, and other advanced tools), personal differences in experience, competence, and performance levels, we can get a slight idea how complex the situation can be. All members act as an information sender and as an information receiver. The communication does not happen just from one to another person, but also from one person to two

persons or to all members of the team (Hoover 2002, 23). Or even from all team members to every other team member.

2.4 Borders of teams

Who are team members? Where does the team work? And when does the team work? These are questions that cannot always be easily answered. This is especially true in virtual teams where organizational limits and time zones and even continents can be crossed.

As mentioned, there are differences within the concept of virtual teams. Depending on the structure of virtual team different tools and methods can be used. Also the organization limits in some virtual teams are different from others. Team members do not necessarily represent the same organization. Because of this, one way to categorize different kind of virtual teams is to divide the teams to in-house virtual teams and cross-organizational teams.

In in-house teams the working methods of the organization are usually widely known and used. The members of these kinds of teams know already each others and how things are supposed to be done. These kinds of teams have been typical in many industry fields since the Industrial Age. After the dawn of the third millennium the teams have begun to spread their limits. (Lipnack & Stamps 2000, 61). At the same time teams have gained new features. They are, not only decentralized and collocated in one organization, but also distributed in many organizations.

In Cross-Organizational teams the boundaries of different organizations are crossed. Problems in these teams can rise because one organization might use one system and other organization uses another. Lipnack and Stamps (2000, 64)

explain that this puts pressure on negotiating and agreeing about the communication and working tools and methods.

Table 2-1 illustrated the varieties of virtuality. Both, in-house virtual teams and cross-organizational virtual teams can be found from the figure. The purest in-house virtual teams are found from the column at the very left: distributed sites and global sites. Cross-organizational virtual teams are found from the top right. The Case team of the study represents this kind of cross-organizational and global virtual team.

2.5 Technology

Without the today's technology the modern business life would not be what it is. The technology works as enabler. Technology also acts as the enabler on virtual teams. Powell et al. (2004, 6) bring the main idea together stating:

Information technology is providing the infrastructure necessary to support the development of new organizational forms. Virtual teams represent one such organizational form, one that could revolutionize the workplace and provide organizations with unpredicted levels of flexibility and responsiveness.

Frey notices in *New Directions in Group Communication* (2002, 285) that increased usage of technological communication methods in group work has raised a question about the roles of these methods. The question is how these methods shape group communication and group communication environment?

The commonly used tools in virtual teams are phone calls, emails, intra-/extranets, instant messengers, video conferences, forums, and cyberspaces. Groupware and Electronic Meeting Systems (EMS) and Group Decision Support Systems (GDSS) make their own contributions to working methods by offering a whole environment for groups to communicate and work

(Mandviwalla & Olfman 1994, 245). Groupware is a term to describe “specialized computer aids that are designed for the use of collaborative work groups”, Johansen (1988, 1) says. Electronic meeting system is a set of technological tools “which strives to make group meetings more productive by applying information technology” (Nunamaker et al. 1991, 41). DeSanctis & Gallupe (1987, 589) described GDSS as a combination of “communication, computer, and decision technologies ... [which] support problem formulation and solution in group meetings”.

Which tools are used in which cases varies. Small teams rarely use video conferences or cyberspaces, but use of phones, emails, and instant messaging is common. Larger teams, instead, use more tools that support more people. (Scerri et al. 2004, 886). That is why forums, extranets, and video conferences are more suitable for the larger teams. And in many cases these tools are more expensive and might be out of small team budget for that reason only.

However, it is the technology which makes it possible to access many kinds of information sources. It is widely known that the computers increase the range and depth of information. McGrath & Hollingshead (1994, 5) tell that decreased time in information searching, processing, presenting and sharing offer ways of improving work and saving costs.

McGrath & Hollingshead (1994, 8) know that the technology also sets constraints to communication. Written text does not transfer the slightest tones of voice or the smiles and gazes made when writing the text. These paraverbal and non-verbal gestures can change the meaning of a whole phrase, so one must consider carefully if trying to be sarcastic or mean something else than exactly written.

The spread of technological communication media is wide. One way to categorize these mediums is to divide them to synchronous and asynchronous mediums as done earlier in this study. In detail synchronous communication

means communication which is time dependant, and consists of simultaneous, overlapping and chronological events. Conversations and phone calls are good examples of synchronous communication. Asynchronous communication, in contrast, is not time dependant and does not rely on immediate delivery of messages from sender to receiver. Because of this, asynchronous communication is also referred as time-independent form of online communication (Frey 2002, 287). Emails and bulletin boards are examples of asynchronous communication tools.

2.6 Scope of the Study

As we go further on the study some limitations on the field of the study must be done. This study focuses, as mentioned, on small virtual teams. In this study all teams above 10 personnel (team members) are not considered as a small team.

As the number of people in a team increases, increases the number of possible interactions too:

Table 2-2 People and Interactions (Adapted from Harris & Sherblom, 1999)

People and interactions							
Number of people in group	2	3	4	5	6	7	8
Interactions possible	2	9	28	75	186	441	1 056

The Table 2-2 clearly demonstrates how complex the communication can get when the number of team members increase. The Case team of the study consists of approximately 5 members, in its daily work.

Also, the teams of interest are commercial teams aiming to make profit in business. Other kind of teams, like political parties, sport teams, non-profit

associations, and charity teams are not being studied or considered as small virtual teams of interest in this study. The team in the Case study represents this kind of commercially oriented team which has less than 10 team members.

The framework of the study is based on the literature so that it is applicable in multi-cultural teams as well as single-cultural teams. The Case study is performed in small multi-cultural team to support the multi-cultural aspect of the framework and the study.

To narrow down the domain of this study, the whole life cycle of a team is not studied. This study focuses mainly on team building phases. This phase can be determined for example with help of Tuckman's group development model (Figure 2-3) which was developed back in the 1965 (e.g. Hoover 2002, 60).



Figure 2-3 Group Development model by Tuckman 1965

As the Figure 2-3 demonstrates, Tuckman's model consists of five separate stages. Van Meer & Sigwart (1989, 52) described these stages quite well back in 1989: The forming stage refers to the early stage where individuals and the group itself are uncertain about what lies ahead. At this point the group have devoted little time, or no time at all, to decide how the team should operate and accomplish the task they are supposed (Woodcock 1979, 10). This stage is usually quite short and is limited mainly to the initial meeting.

Van Meer & Sigwart (1989, 52) tell that in the storming stage conflicts between team members arise. As personalities collide and the roles of each team members are not clear, the team has to resolve the issues and evolve. After the

dirt has been examined and cleaned, the team can become healthier and more ready to act (Woodcock 1979, 11).

In the norming stage (and partly in storming stage too) roles and leadership in the team start to form and normalize, Van Meer & Sigwart describe (1989, 52). In this stage the relationships in the team and between the team members are defined. Also, norms and goals are set before the team moves on to the performing stage, Van Meer & Sigwart (1989, 52) continue.

In performing stage the actual work is performed and done. This kind of mature team is flexible about the issues they are working with and the methods they are using. The team members are not anymore defending their positions as earlier and leadership can be determined depending on the situations not by protocol, Woodcock explains (1979, 12).

Adjourning stage is the last stage of team history. In this stage the team stops working as a team and the team members start doing something else. (Van Meer & Sigwart 1989, 52).

In this study only the first three stages (forming, storming, norming) of Tuckman's model are included, as the interest is in the building phase of a virtual team. Performing and adjourning stages are left out from the study as they do not belong as such to the team building phase. This limitation is done for two main reasons: Firstly, life cycle of a virtual team is too wide to be examined closely enough in a Master's thesis like this study. Secondly, there is plenty of material about improving team performance when it is ready and working, written earlier.

Edwards et al. (1996) performed a case study on virtual team building. In their article "E-team: Forming a viable group on internet" they present the results of their study. According to their results and analysis they concluded that in team building stages, Tuckman's group theory is as valid in virtual teams as in

traditional teams. (Edwards et al. 1996, 163). Because the Edwards study and the results of it, the first three stages of Tuckman's model are considered to be valid viewpoint for this study.

Technological tools and software are studied in full scale in the literature earlier. This study leaves out the technical aspect, because there is plenty of studies, articles, and books written about emails, intranets, video conferences, instant messaging, forums, CSCW (Computer-Supported co-work), EMS (Electronic Meeting System), GDSS (Group Decision Support System) and other groupware.

In contrast the challenges that a team can confront, especially in the building phase are in the interest of this study. The common challenges in the virtual team field which are the focused interest of this study are illustrated in the next chapter 3 Virtual Team Challenges.

2.7 Summary

This chapter has described the multi-dimensional playground of virtual teams. Virtual teams were defined as "a group of people who work interdependently with a shared purpose across space, time, and organization boundaries using technology" (Lipnack & Stamps 2000, 18). Also some definitions were done to illustrate the differences between traditional and virtual teams, in-house / cross-organizational teams, and the difference between virtual teams and outsourcing. There are more than enough of factors affecting the success of a virtual team. Many of the factors causing challenges to traditional teams are true in the case of virtual teams as well. Challenges, however, are not limited to the challenges that traditional teams can confront. In virtual teams the technology, time and space set constraints that must be overcome to foster

success. Also cultural backgrounds tend to be more diverse in virtual teams than in traditional teams.

Communication between different people from different organization and cultures with different kind of tools is not a simple thing. Adding to it communication from a continent and time zone to another make it such a challenge that it should not be taken lightly.

To understand the virtual team field in its whole meaning and with the finest nuances of it, plenty of further study must be done. To bring together the terms and issues discussed in this chapter, a clear summary table is here presented:

Table 2-3 Challenges Summary

	Traditional team	Virtual Team	Case team
2.2 People in teams	Usually the national language is used, and members represent the same culture.	Members can (and usually do) represent different nations and cultures.	Members represent different nations and cultures.
2.3 Communication in teams	Most of the communication is face2face communication in synchronous mode. Team members are located in the same space, in the same time.	Communication can happen both in synchronous and in asynchronous mode. Different languages are locally spoken and time zones are to be noticed.	Communication happens in both, asynchronous and synchronous. Members are also located in different time zones
2.4 Borders of teams	Usually members belong to same organization or company. Some times a member of two can be representatives of a customer organization.	Members belong to same department of a company (internal team), or to same company but different departments (cross-internal team) or they can even be each members of different organizations (cross-external)	Members represent different organizations. The Case team is cross-external as the team members represent different organizations.

Continued

Table 2-3 Challenges Summary (continued)

2.5 Technology	Technology is used mainly on presentations and to support demonstrations. Also memos and documents can be created and modified with help of technology	Technological communication devices are crucial, they enable the communication. Constraints set by technology must be noticed.	Many technological communication channels are used (Phone calls, Extranet, Emails, Instant messaging)
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Each of the cells in the table reflects the nature of certain type of teams when it comes to 2.2 People in Teams, 2.3 Communication in teams, 2.4 Team borders and 2.5 Technology. First column describes the traditional team, a team where the members are usually located in the same place, in the same time. Second column represents the situation of virtual team. Virtual teams can be quite different from each other, so definition cannot here be very exact. The last, column brings down the discussed aspects by reflecting them to the Case team of the study.

This chapter aimed to describe the general factors and players in the virtual team field. This chapter also played the role of introduction for the next chapter, which explains some important challenges of the virtual teams in more detail. The next chapter is Virtual Team Challenges.

3 VIRTUAL TEAMS CHALLENGES: THE FRAMEWORK

In this chapter some of the main challenges of virtual teams are presented. This chapter acts as a base material for the framework presented a bit later. The virtual team challenges discussed here can be, and partly are, overlapping with the challenges of traditional teams.

According to Hoover (2002, 145) old working habits are stuck on people and it can be hard to change these habits. Hoover (2002, 145) also mentions that unwillingness to participate can lead to a problem situation where a team exists, but it is not working due the unwillingness to do anything.

The reason for unwillingness to participate can be because of many things. Some people might be scared of new technological tools they are not familiar with. In addition to this "technophobia" they might have reasons like fear of losing their privacy, status or even jobs.

Trusting people you have just met (or even people you already know) might not be the easiest thing in any kind of teams, Kanawattanachai & Yoo (2005, 42) mention. In virtual teams you might never actually meet the people you work with and still you should be able to trust them.

Some people you might have to work with are turned inwards, other outwards. Some are quiet, some are talkative, etc. As people are different from each others, the personal differences can cause challenges. Backgrounds of people tend to affect on how they work.

Vinaja tells in his article (2003, 341) about cultural issues around virtual teams that virtual teams are usually distributed. These teams can be distributed to different cities, time zones, cultures and organizations for example. These all set constraints and challenges for team work.

Communication and hierarchy must be mentioned here too. In virtual teams where team structure cannot always be clearly seen, it is important to know who is responsible of what and to whom. Piccoli & Ives (2000, 577) say that unclarity often leads to chaos and makes people to work inefficiently.

For sure, there are many other challenges that can, and do, have effect on team work. This study, however, concentrates on these just discussed aspects.

3.1 Old habits

When someone has done something in the same way for a long time, it is a hard to change the way of working. From any industry fields it is not tough job to find someone saying "I've been doing this job for decades and this is the best way". Usually these people lack the knowledge about newer or more efficient ways of working, and the willingness to know about them. This attitude can be devastating for a business. Especially in IT (Information Technology) field where it is very important to keep up with the changes and be aware of the new styles.

When old habits are stuck and attitudes towards any changes are strong establishing of virtual team can be difficult. According to Hoover (2002, 145) these attitudes can lead to a situation where a virtual team exists, but it is not functioning. Hoover (2002, 145) also mentions that responsibility to change oneself or to take part in something new or different can also make people go passive.

These stuck habits and change resistance can be a bigger problem for virtual teams, than they are for traditional teams, because virtual teams usually involve new working methods and tools. Just getting people to work in new way can be hard itself, not to mention involving whole new set of technological devices.

These tools may cause yet more challenges as people can also be scared of the new technology. (Grenier & Metes 1995, 225; Grudin et al. 2005, 257).

3.2 Technology fear

In virtual teams new kind of technological equipment and tools are used. If one does not have experience in using computer, emails, internet or other “advanced” tools, one might be scared of them. The book *Technophobia* (Grudin et al. 2005, 257) which concentrates on fear issues around technology, says that technology fear, or technophobia, is real. Despite the fact that many think that it is history nowadays.

Elder people and people that have worked long time in the same way can have the problem with stuck habits as told in the previous chapter. In many cases this can appear in the shape of technology fear (technophobia). This technology fear is common, naturally, among people who do not have lots of experience on computing (Grudin et al. 2005, 257). Brosnan (1998, 10) tells that usually the word technophobia is used to describe people who resist using computers or other high-tech equipment when they are given an opportunity to use them. This definition is used also in this study.

“Added responsibility and expanded autonomy mean that both the technical and behavioural skill repertoire of employees must be expanded”, Stewart et al. say in *Team Work and Group Dynamics* (1999, 157). This means that people have to learn new things and adjust themselves to new kind of situation, like the context of working in virtual teams.

Learning new, changing and adjusting habits and manners can be frightening thing and it always causes resistance. According to Brosnan (1998, 122) this resistance can be reduced via training and education. Studies have shown that

when people are focused more on the task performed than on the medium used, the psychological impact is minimized. Based on the claims of Brosnan it can be proposed that education and training can reduce technophobia and increase the chances of building a good working virtual team.

Behind the curtain of technology fear can be other things as well. Hoover (2002, 145) tells that these factors can be for example the fear of losing control on own job, fear of breaking status barriers or even losing one's job.

3.3 Fear of losing control / job / status

Grenier & Metes (1995, 223-224) know that new working tools and methods can make people be afraid. People might be scared of losing their control on important issues, like their privacy and security. New kind of automatic processes can also make people to be afraid of losing their jobs. Grenier & Metes (1995, 223-224) tell that as virtuality decreases the vertical aspect of organization which may make some people to be concerned about their statuses.

According to Hoover (2002, 145) fear of losing one's power and control can be one of the major challenges to overcome. Stewart et al. (1999, 156-157) explain that this can be because middle managers, supervisors and other "high-status" employees tend to think that they have more to lose than to gain from teams. Also senior members of working community seem to feel like losing their seniority status in teams, Stewart continues.

Hoover explains (2002, 145) that new working habits and techniques always shape the working environment and organization. If there is something unclear with the procedures or ways of working people can be scared. People can be worried for example about losing their statuses or even their jobs.

In many cases fear of losing status can appear in the form of decreased trust (Hoover 2002, 145). Trust issues are discussed next.

3.4 Lack of trust

Without trust any kind of good relationship cannot work. This is true in personal relationships as well as in business relationships or work relationships. Relationships which have trust among the participants are more likely to perform better than the relationships without such trusting.

Kanawattanachai & Yoo (2005) completed an empirical study about the dynamic nature of trust in virtual teams. Their studies (Kanawattanachai & Yoo 2005, 42) have implicated that when working with new people or even with people you know, trust has a very big role. Without trust any relationship cannot work. In many virtual teams you may never actually meet the people you work with and still you should be able to trust them. Building trust might be the hardest thing in any kind of team, virtual or not. In virtual teams sometimes it is just impossible to arrange face to face meetings, where the trust building is most natural. In contrast, Mark (1998, 41) refers to work of Järvenpää & Leidner (1998) when claiming that trust in virtual teams may form faster than in traditional teams, but it may not be substantial.

The members of virtual teams work together apart. Lipnack & Stamps (2000, 70) say that this puts a special effort on trust, because one must be able to trust that the others work for the common goal too, without seeing them working. Without face-to-face communication the slight nuances of speech and the whole non-verbal communication lacks, and makes it harder to attain trust, and easier to lose it.

Trust is “the glue that holds and link virtual teams together”, Kanawattanachai & Yoo point out (2002, 42). Kanawattanachai & Yoo (2002, 44) refer to the work of Iacono & Weisband, and Jarvenpaa & Leidner when explaining the effect of trust: Analyses of earlier studies have shown that high-performing and high-trusting virtual teams exchanged more background and personal information about themselves in the early stages of team. High-performance teams were also found to communicate continuously and frequently.

Several books and articles are written about trust in virtual teams. This study tries to give a general view on the challenges and not to focus specifically on a one challenge. Because of this limitation trust issues are not studied any larger than this.

3.5 Personal and organizational differences

As said in chapter 2.2 People in teams, people can be different. They are not only males or females, extroverts or introverts, or short or tall. People have thousands of personal qualities which differentiate them from each others. One values work over family, other values religion over freedom of speech for example. One likes day by day work and another likes to be driven by approaching deadlines (Hoover 2002, 38). These personal differences cause problematic situations in traditional teams, as well as in virtual teams. Lack of visual and physical contact puts special pressure on resolving personal qualities and habits in virtual teams. Backgrounds of people tend to affect on how they work.

According to Vinaja (2003, 341) virtual are usually distributed to different cities, countries and organizations. Different organization can have different kind of protocols and systems. These can have some influence how people are used to

work. In cross-organizational virtual teams the systems and protocols must be adjusted so that they fit all parties.

3.6 Cultural differences

Vinaja (2003, 341) tells that virtual teams are not distributed only in different cities, but in different time zones and countries too. This makes the culture to have part in working habits, hours and places. Vinaja (2003, 341) explains that multi-cultural teams face challenges in many areas of team work: time delays in replies, communication problems, cultural conflicts, and limits in joined working hours.

Churchill & Bly (2000, 8) say: When designing new application designated to multicultural teams technological infrastructures of participants must be carefully considered. Technical boundaries, like speed of connections, may vary and cause problems if not being noticed. Basically this means that one might have poorer network connection and due that poorer possibility to use a system than others.

Challenges are not, of course, limited to technological aspects. Vinaja (2003, 342) points out one obvious barrier when working in multi-cultural: the language. In different countries different languages are spoken. In today business the most common language is English which is taught and learned in almost all educationally and technologically advanced countries. As English can be said to be the main language of IT field, this study does not consider the basic problems of understanding and producing good language as noticeable challenge. This does not, however, mean that language problems would not exist among virtual teams.

Communication and work of virtual teams break the cultural aspect mentioned. "When people occupy different places and some from different organizations, they can be certain that they will have to communicate across culture and custom with different languages", Lipnack & Stamps (2000, 66) emphasize the problems of communication.

It is clear that different cultures have different kind of impacts to teams. "Virtual teams must recognize discrepancies between cultures in order to work efficiently and effectively", Vinaja emphasizes (2003, 342). Stewart et al. (1999, 43) tell about studies which have shown that culturally homogeneous teams have more positive social interactions and performance in the early phases of team history than multi-cultural ones. However, the performance of multi-cultural teams has improved over time and they became as effective as their traditional counterparts, Stewart continues.

The internet age we are now living has brought together many cultures. Vinaja (2003, 342) tells that working in multi-cultural teams can also increase the awareness of foreign cultures and lessen the problems and challenges caused by the cultural issues.

3.7 Structural and managerial issues

As virtual teams are new kind of teams, there can be problems in communication and hierarchy if the team structure is unclear. Piccoli & Ives (2000) have studied the effects of managerial issues on team effectiveness. Who is whose boss and who should report to whom? Which role I have? Which role you have, etc.? Piccoli & Ives say (2000, 577) that unclarity often leads to chaos and makes people to work inefficiently.

Harris & Sherblom (1999, 38-39) explain that groups have norms (formal or informal) to define the nature of the group. Norms also define the relationships

among the team members. In teams certain actions are accepted and other prohibited. These norms include the accepted behaviour patterns, shared values, procedures, and general guidelines of acting. According to Harris & Sherblom (1999, 41) norms change. In small teams norms are quickly developed and they change over time faster than in their bigger companions.

In all groups people take these certain roles to act. Harris & Sherblom (1999, 41) quote Hare (1994) by telling that a role is position and status associated thing which implies the rights and duties of the team member towards the group. "Roles translate between me and we, between bottomless complexity of individual people and the comparative simplicity of playing a part in a group", Lipnack & Stamps (2000, 173) describe roles. "A role is a set of behaviours that is characteristic of a person in a specific situation", defines Stewart in *Team Work and Group Dynamics* (Stewart et al. 1999, 38). For example student's role in lecture is to listen and make notes while lecturer's role is to give the lecture. People do not have just a one role in their lives, but many roles at the same time: one has the role of student at the same time with the role of spouse of another person and the role of employee. Another one is a lecturer and teacher during the day and student at evening. Each role has own different characteristics. Person acts differently when being a student and when being a spouse. Rothwell (2001, 123) explains that especially in small teams, where the number of team members is limited, team members have multiple roles. Norms and roles are at best when they are calming things down and making things go steadier, but can they can also cause conflicts or even make the team to break down.

As managing traditional teams can be hard, managing a virtual team can be even harder. Vinaja (2003, 342) tells that this is because of the varieties in personalities and working habits. Finding the common way of communication and working can be a tough job. In building of a virtual team the managers must be able to understand the diversity that exists in virtual teams, especially

in multi-cultural teams. Managers must see that all parties of the team are able to participate and benefit from the interaction.

Piccoli & Ives (2000, 577) completed a study to test the impact of managerial control on team effectiveness. Based on earlier evidence they made an assumption and conclusions that virtual teams that have higher level of communication are more efficient.

Vinaja (2003, 342) tells about a statement of Lipnack & Stamps that managing effective virtual team requires 90% people and 10% technology. This statement shows that even virtual teams are highly technology dependant, people play the most important role. Keeping team members connected, communicated, and motivated demands lot's of skills from the manager. Casey & Richardson (2006, 70) quote Dawson (1992) claiming the motivation to be the mainspring of behaviour, the key element which explains why individuals choose to work to achieve particular goals. Problems may also rise because not everybody embraces the virtual form of team work.

One of the managers', or group leaders', job is to keep the team understanding the reasons for successes and failures. Harris & Sherblom (1999, 20) tell that this is because understanding the reasons of success or failure is the key to improve performance and to predict the future. See Figure below.

Table 3-1 Successful and unsuccessful groups (adapted from Harris & Sherblom, 1999, 21)

	Unsuccessful	Successful
Understands	Group 1: Unsuccessful, but understands why. Likely to be able to learn and succeed next time	Group 2: Successful and understands why. Likely to be successful in the future too
Does not understand	Group 3: Unsuccessful, but does not understand why. Likely to fail next time too	Group 4: Successful, but does not understand why. Likely to fail next time. "Lucky this time"

Harris & Sherblom (1999, 20) explain the effects of understanding the reasons of the success/failure: If the outcome of your team is a failure it is not the end of the world. At least if you understand the reasons of the failure. If you have understood the reasons your team failed you have the possibility to learn and adjust your ways of working. This way the next time might be a success. In contrast, if you do not understand the reasons of failure, your future does not look too bright. Next try is likely to fail too.

Success in a task does not guarantee the success next time. Understanding the reasons for the success does. And it works both ways: if you do not understand the reasons of the success, it is just a matter of "luck" if your next task is a success or not. (Harris & Sherblom 1999, 20).

Understanding the reasons of success or failure is also a success factor for bigger teams. If understanding of success or failure is lacking, the future is not too bright for bigger team either.

3.8 The Framework

The framework is presented in a clear table format where the challenges are presented in the different rows. The two columns are filled in as this study goes on. First column is filled with knowledge from the previous chapters. The second row is completed with the help of the Case study.

As said, the challenges to the framework are chosen based on the literature written about virtual teams. These chosen challenges are mentioned in many books and articles and are here considered to be more important than some other challenges.

It was already stated in the previous chapters that there can be some challenges that can have a major effect on the performance of virtual team which are not here presented. This framework contains some of the most common challenges mentioned in the literature.

The chart contains two columns and eight rows. Each row contains one chosen challenge. The columns of the framework tell what the common situation in virtual teams is in general and what it is in the Case team, regarding each challenge of the row.

The Framework

Table 3-2 Framework of the study

	Virtual teams	Case team
Old habits	Stuck habits can cause unwillingness to participate and can lead to a situation where a team exists but is not functioning	
Fear of losing control job status	One can be concerned about his/her status or work place because processes get automated with virtual teams. Also control on one's privacy... and security can rise doubts	
Trust issues	Without trust any kind of team cannot work. Trust is mentioned to be the glue that holds teams and relationships together.	
Personalities	Differences in personalities can cause damage, but also bring richness to communication and team work	
Organizations	Organizations differ in many ways like size, working methods and tools, etc. These differences must be noticed when building a new team.	
Cultures	In virtual team cultures can collide if they are not noticed appropriately. However, culturally aware people do not necessarily have problems with other cultures	
Technophobia	Fear of technology can be devastating for virtual team. If technological tools are not used, virtual team cannot exist	
Team structure	If team structure and roles are not clear, a chaos might be the result. Usually people need to know who is responsible of what and to whom	

Each cell of the Framework summarizes the contents of the previous chapters in short fashion. The other column is filled in with the help of the interviews and the analysis of them.

3.9 Summary

The purpose of this chapter was to explain the most crucial challenges affecting virtual teams. Winning these challenges is the key to the success.

Old routines, technophobia, fear of losing control or job or status, trust issues affect every member of virtual teams. Differences in personalities, cultural backgrounds and organizational procedures can cause problematic situations too. Also roles and managerial issues of these virtual teams should be noticed.

Though many challenges are to be noticed and considered it is not impossible to build a working virtual team. The Framework of the study was also presented in the chapter.

4 CASE: SERVIA FINLAND LTD.

The Case study which is completed to complete the framework is presented in this chapter. With Case studies single or small number of cases is studied in depth and the results of the studies are then generalized, if appropriate. According to Helander et al. (1997, 1435) Case studies are very useful when studying new or little studied subject of interest. Servia Finland Ltd uses small virtual team when producing websites for their customers. The supervisor/manager position of the writer and the situation of company (growth in both, number of employees and business in general) gave an excellent opportunity to test the validity of the framework when building a new small virtual team.

4.1 The Company

Servia Finland Ltd is a Finnish ICT company founded in 2001. Originally computer hardware shop has evolved during its 6 year history from small retail shop to a boundaries crossing virtual organization with several hundreds of customers and tens of partner companies. Present day business is concentrated on selling and developing easy-to-use CMS (Content Management System) software called "VerkkoVelho".

Key success element of VerkkoVelho is in the ease-of-use. VerkkoVelho has been designed to have high usability and learnability. It is been promoted as the easiest CMS system available in the Finnish markets. Also last satisfaction survey (3rd quarter of 2005) returned 95% percent satisfaction in the usability and in overall performance. In addition to the ease-of-use factor another key success element is graphic design. Designers trained and concentrated

especially in web design are experienced and qualified professionals. Designs are innovative and fresh, and they are always tuned until the customer is 100% satisfied.

Part of the workforce of Servia Finland Ltd. work abroad. Some graphic designers, web coders and other professionals are connected to offices of Finland only with the technological devices of today. Connections and communication are done daily to, for example, India and Romania.

4.2 Common customer project

Despite the fact that every customer case is different, they are quite similar and the projects follow a certain pattern. The project phases are modelled in the slightest detail and by following the model most of the projects are completed in time and effort.

Each project consists of several workers. The project coordinator acts as the contact person for the customer. Commonly the customers are Finnish and the communication between customer and project coordinator happens in Finnish, by phone and email. Project coordinator also acts as interpreter between the customer and the production team.

Production team varies between the projects. The production team works in a very virtual way as the team members in most cases are located in different countries and time zones. The most used tools in communication are emails and instant messaging (through a production system which logs the activities and communication). Also phone calls and small video conferences are usual. A common project contains usually the project coordinator, customer representative, graphics designer, technical expert, and their assistants.

4.3 Study method

The main study method of this thesis is a Case study. According to Yin (1994, 13) Case studies investigate determined phenomenon in real-world context. He also notices that Case studies usually come to picture when the differences with the phenomenon and study context are not clear. In this study the question is if the Case team has noticed the same challenges in its work than in the literature it is been proposed.

Yin (1994, 125) also reminds that in general Case studies cannot be estimated as perfect or complete as Case studies study certain phenomenon in a only one specific context.

4.4 Data collection method

In this study the purpose is to test whether the general challenges of virtual teams match the challenges of the Case team. To receive valid data from a quite small group an interview method is chosen.

Studied persons are interviewed and the results of the interviews are studied and analyzed. The interview form with the main questions and themes can be found from Appendix A. The interview form which was created by the writer was studied in detail with colleagues of the writer and tested in detail with sample persons.

In the interview situation the interviewer and interviewee were in contact either in face-to-face situation, or through audio-visual device (Audio and Webcam techniques of Microsoft Messenger were mostly used to gain both speech and visual contact). The background of the study and the interview method was briefly explained to the interviewees.

After having some problems in acquiring and getting video recording devices to work, it was decided that the interviews would not be recorded. To compensate this loss the interviewer tried to write down also other material than verbal answers (e.g. facial gestures, body movement, voice tones).

In the interviews total of seven (7) persons were interviewed. These seven persons were picked from the organization of Servia Finland Ltd. or from partner organization of Servia. All the interviewees were or had been working in a small virtual team.

Ages of the interviewees varied from 22 to 43, with most (4) of the interviewees being 23-26 year old. Average age was 28.

Five (5) of the interviewees were male and two (2) female. Unfortunately more females were not available for this study to get more non-gender specific results.

As mentioned this Case team consisted mostly of the virtual team members of production / project team of Servia Finland Ltd. All members had some experience about working in virtual teams.

Any customer could also be considered as a team member, but as the customer changes between the projects, single customers are not considered as real members of the team. At least in the same way as the other members of the virtual team which do not vary between the projects. This is why there are no customers interviewed in this study. Also a customer of Servia usually sees only the one contact person they have been assigned. The virtual project team behind the contact person is not visible to the customer.

5 ANALYSIS AND EVALUATION OF THE STUDY

This chapter analyses the interviews and evaluates the validity of the framework presented. Yin (1994, 102) tells that analysing case study evidence is not an easy task as its techniques have not been very well defined in the past. In this study the data analysis consists of categorizing the interviewees, examining the interviews, and making notes about the interviews and answers.

Each challenge of the framework is analyzed separately and as whole in this chapter. First all challenges are discussed in detail and then some general conclusions are made in the summary.

5.1 Analysis method

Analysis was completed in two iterations. At first round the interviewer read all the interview forms carefully and made notes about the answers. The second round was performed three days later to make sure that nothing was forgotten or misunderstood.

Interview answers were categorized to get a good general view on each challenge. At the end of the interview the interviewees were asked to estimate the importance of each challenge in the scale of 1 to 5. Averages from these values were also calculated.

5.2 Completed framework

Based on the interview questions and the analysis of the answers, the framework is completed:

Table 5-1 Completed Framework

	Virtual teams	Case team
Old habits	Stuck habits can cause unwillingness to participate and can lead to a situation where a team exists but is not functioning	In general old habits were estimated as a minor challenge. However, it was noticed that even one person with old habits can have big influence on team performance
Fear of losing control job status	One can be concerned about his/her status or work place because processes get automated with virtual teams. Also control on one's privacy and security can rise doubts	This challenge was noticed to be quite important one. Stress, exhausting and burn-out were symptoms mentioned in the interviews. Finnish persons estimated this challenge more important than Romanians.
Trust issues	Without trust any kind of team cannot work. Trust is mentioned to be the glue that holds teams and relationships together.	Trust was estimated to be one of the main challenges according to the interviews. This was true regardless the sex or nationality.
Personalities	Differences in personalities can cause damage, but also bring richness to communication and team work	As expected, personality differences were noticed both: positive and negative. Males and females, and Finnish and Romanians all agreed on this.
Organizations	Organizations differ in many ways like size, working methods and tools, etc. These differences must be noticed when building a new team.	Interviewees knew that different organization have different methodologies. Romanians considered teams as hierarchical trees, and Finnish as networks.
Cultures	In virtual team cultures can collide if they are not noticed appropriately. However, culturally aware people do not necessarily have problems with other cultures	In the Case team cultures did not collide. All interviewees found cultural issues to have quite low effect on team work.
Technophobia	Fear of technology can be devastating for virtual team. If technological tools are not used, virtual team cannot exist	Technophobia was considered not to be a real challenge for virtual team workers. It was noticed, though, that technophobia can exist.
Team structure	If team structure and roles are not clear, a chaos might be the result. Usually people need to know who is responsible of what and to whom	Unclear team structure was considered to be the main reason for failures. Team structure challenges were estimated to be the most important ones.

The second column of the framework is now filled in. The texts of each cell are based on the interviews and the interview results.

Each challenge is now discussed in more exact fashion. This is to give a larger understanding about the interview results and about the Case team.

5.2.1 Old habits are stuck

The interview results for old habits had some differences with the framework. In general the interviewees did not find old habits to be a very big challenge.

When asked about the negative effects that old habits might have on virtual teams one of the interviewed people (Male, 23 years, Finnish) stated: " Even just one who doesn't adapt to the team norms can cause lots of negative things to the team. But in general I'd say learning new and getting rid off old habits is a matter of personal attitudes".

Average of the interview values was 2.4. There was no difference in average answers between different nationalities or sexes.

5.2.2 Fear of losing job/status

Based on the interviews fear of losing control on status or even job is a bit greater in small virtual teams than they are in general (based on the framework). The interviewees of the Case team estimated that people really can be afraid of losing their control, status or even jobs.

One of the interviewees (Female, 43 years, Finnish) found the threat most severe stating: " The fear losing job or control on one's work can rise from the fear of

not learning to use all the new devices and communication channels. And this can cause lots of stress, exhausting or even burn-out”.

Average of the interview values was 3.3. Between males and females there was no remarkable difference between the average values. However, Romanian representatives did not think this matter to be very important (average value was 2.5, whereas Finnish average was 3.6). The reason for this difference was unclear and some further studying should be done to resolve the reasons behind this difference.

5.2.3 Lack of trust

Trust issues were found to be quite important in the interviews. All interviews estimated trust issues to be one of the most important challenges.

“There is at first that *unconditional* trust... You trust a person until he or she proves not to be trustable”, stated one of the interviewees (Male, 26, Romanian) about the trust issues. Although all the interviewees agreed that trust is very important thing and without trust teams could not work, they did not value it highest in average.

Trust issues were estimated to be very important, regardless the nationality of the interviewee.

Average answer of all interview answers was 3.9. Finnish interviewees valued trust issues a bit higher (4.0) than Romanian interviewees (3.5). Also there was a slight difference between females and males. Females gave an average value of 4, whereas males 3.8.

5.2.4 Personal differences

Interviewees noticed the importance of personal differences between team members. Differences were recognized both as positive and negative things. "If all members are alike and agree all the time, there wouldn't be any critic or critical conversation about anything", explained one interviewed person (Male, 23 years, Finnish).

The average of the interviews answers was three (3.0). There was no remarkable difference between nationalities or sexes.

5.2.5 Organizational differences

Interviewed representatives of small virtual teams found it quite important that the representatives of different organizations know how to work in their mutual virtual team.

A male interviewee (25 years, Finnish) stated: "Methodologies differ dramatically depending on what kind of companies are working together. It seems like smaller companies have more informal methods while bigger companies tend to have more bureaucracy". Also other interviewees agreed that differences in organizational working methods could cause problems and challenges.

Some more research should be done to get deeper sight on the effects of organizational differences for virtual teams. The average answer on scale 1-5 was 3.0. This challenge received the most variation in the average answers. The average male answer was 3.2 and average female answer was 2.5. The reason for this difference was left unclear. The difference between Finnish and Romanian answers was as high as 1.4, Finnish interviewees giving an average value of 2.6 and Romanian 4.0.

The Romanian interviewees seemed to think team structure in clear hierarchical format whereas Finnish interviewees considered virtual teams to be rather networks of equal workers than hierarchical organizations. More studying should be done to say if there really are differences between the visions about virtual teams among different nationalities.

5.2.6 Cultural differences

The results of the interviews indicated that culture does not have too big effect on virtual teams. The average of the interview answer was as low as 2.1.

“Usually people who are a part of a virtual team are more understanding and able to think a bit outside the box”, analyzed one interviewee (Male, 23 years, Romanian). Other interviewee (Male, 25 years, Finnish) explained that many companies doing outsourcing have adjusted themselves to be able cope with all kinds of cultures so that the cultural differences have no effect on performing the job.

On average females estimated the challenge as 3.0 in the scale from 1 to 5, whereas males gave an average answer of 1.8. Also Finnish virtual team players of the Case team gave average value of 2.4 whereas Romanians gave 1.5.

Cultural issues are highly promoted in the literature concerning virtual teams and the surrounding issues. This study, however, gives evidence that the cultures do not collide, at least as much it is been promoted in the literature. Some more studying and search should be done to confirm how much of a challenge cultural issues really are.

5.2.7 Technology fear

Technophobia was considered not really being an issue on today's working life. The results of the interviews and the average answer of the interviews were in a line with the framework.

"Our industry is more technological than most. All the communication tools are used every day and no fear occurs", explained one of the interviewees (Male, 25, Finnish). "With computers at home and in work places people are nowadays very familiar with all the technical equipment and there's not much technophobia", told a female interviewee (age 29, Finnish).

With some caution, it can be stated that technophobia is not a challenge for virtual teams. At least in the Case team. Though technophobia surely exists and especially elder people may suffer from it, it is not a real challenge in virtual teams where people are somewhat familiar with technological devices.

The average answer of all interviewees was 2.0. There was no difference between the answers regardless the sex or nationality.

5.2.8 Unclear team structure

The importance of clear team structure was noticed very high in the interviews. Importance of clear structure was evident: "In my opinion it is very important that all the members of a team know who is responsible of what and to whom. When responsibilities are assigned and the structure is clear motivation to work increases", explained one interviewee (Male, 23, Finnish). "Clear structure saves time and makes things work easier", stated another interviewee (Male, 27, Finnish).

Unclear team structure was estimated to have the most severe impact of team performance. The average interview result was 4.3. Variation between the average answers was quite low. Males gave a bit higher value (4.4) than females (4.0) and Romanians gave a bit higher value (4.5) than Finnish (4.2).

Both the framework and the interview results indicated that team structure very more than important. When people know who is doing what and who is responsible and in charge, things go smooth. As the performance of virtual team is highly dependant on clear team structure it is important to put some effort on building a clear structured team.

5.3 Validity and reliability of the study

To make this study more valid and reliable some points could have been done better. The sample of the study was quite small (only seven (7) interviewees) and their cultural background could have been more diverse (2 nationalities were represented)

Also age scale (which was 23-43) could have been wider as majority (4) of the interviewees was 23-26 years old. The number of males and females was a bit unbalanced too (5 men, 2 females).

Also as the interviews were analyzed by the writer, there is a possibility that the study was not completely objective. Background, education and skills of the writer have surely had an effect on how the interviews were analyzed and interpreted. Despite there are some points for criticism the study was done by following common academic research and can be considered as mainly trustable source of information for anyone searching for information about small virtual teams and their challenges. The evidence from the Case study

cannot be generalised, but it gives a nice look on this particular team and on the opinions of the representatives of the Case team.

5.4 Summary

This chapter presented and analyzed the results of the interviews. All challenges presented in the framework were analyzed and reflected with the framework.

In addition to discussing about the challenges, the interviewees were asked to estimate the importance of each challenge in the scale of 1-5. According to the interviewees the most important challenge of the framework was team structure, or lack of it. The average estimation for the challenge was 4.3. The second important challenge was trust. Average answer was 3.9.

Technophobia and, surprisingly, cultural issues received the lowest average values (2.0 and 2.1). Of course the fact that all of the interviewees had been working with computers and high technology equipment in multi-cultural teams quite a much, had an influence on these estimations and average values.

More research should be done to find out the differences between small virtual teams and virtual teams in general. Based on the interview results of the Case study, challenges mentioned in the literature are to taken for real.

6 CONCLUSION

The purpose of this study was to illustrate the key challenges that small virtual teams face especially in the early stages of its life. General and some more complex terms of the field were presented at the beginning of the study and the phenomenon and the detailed challenges in the later part of the study.

The literature on the subject is rich and wide, but also a bit scattered. Small virtual teams need more attention as small businesses are forming alliances and virtual teams to gain market and efficiency.

By bringing the literature about the field of the virtual teams together, this study hopes to have given a general view on the matter and a bit more specific view on the challenges of the small virtual teams.

To make this study concrete a framework was created to present the challenges in a clear table format. After the framework was created it was tested with a Case study.

In the Case team issues regarding team structure and trust were noticed to be more important than others. The interview results indicated that also personal and organizational differences must be noticed. Fear of losing control on one's status or work, or even losing job, was also valued above the average.

Interviewed representatives of the Case teams estimated that technophobia among small virtual teams is not very big challenge today. Also cultural differences were estimated to be a quite small challenge factor, as virtual team players were said to be culturally aware and open.

Old stuck habits were estimated to be some kind of challenge, but not very strong. Interviewees told that people working in virtual teams are usually ready

for changes, but people who are not familiar with this team work form might have problems adjusting themselves to the new working methods.

Although Case studies can never be fully generalized this study hopes to have given a concrete view point for the differences of small virtual teams and virtual teams in general. The Case study was performed in a good academic sense and it can be considered as valid study, though there is always a question of objectivity as the writer has performed all the work by himself.

With some caution this thesis can be used when considering the risks and challenges that a new and small virtual team may confront and what things differs the small virtual teams from their bigger companions.

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APPENDIX A – THE INTERVIEW FORM

1. Technology Fear

What kind of issues come to your mind when discussing about technology fear, or technophobia? Do you think there's technophobia among people working in virtual teams nowadays?

2. Old habits

People are used to work in a certain way using the methods they have once learned. What kind of effect you think these "stuck habits" might have on virtual teams? If a person who haven't worked in virtual team would be forced to work in one, do you think that he would have tough time adjusting into new methods?

3. Fear of losing job / status / control on one's tasks

There has been claims that when people are introduced to work with new methods and technology they might be resistant because of fear of losing their jobs, or fear of reduced status in the working community. Do you think this is true? Do you think that people would consider new technology as a threat to their job or status?

4. Trust

Building trust in virtual communities/teams is claimed to be harder because of lack of physical face2face contact. Do you find this correct? How important factor you think trust is in virtual teams?

5. Personal differences

Based on certain claims, differences in personalities have major effect on team performance. Why's that, in your opinion? How major effect you would consider this to be?

6. Cultural differences

In virtual teams where time zones and continents may be crossed with technology, work people from different cultures. How much do you think cultural differences affect the team work? Do cultures collide and cause problem, or do people realize the differences and understand each other?

7. Organizational differences

Different systems and different working methods are used in different organisations. Do you think that organisational differences have effect on virtual teams? What kind of effect? How remarkable?

8. Team structure

According to some claims on teams in general and in virtual teams, team structure is very important. It's crucial to people to know who is responsible to whom, and who is doing what. Do you find this true? Why?

Fill in values (scale 1-5)

Old habits are stuck	Fear of losing job/status	Lack of trust	Personal differences

Cultural differences	Organizational differences	Technology fear	Unclear team structure

Other remarks: