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Understanding reasons for choosing certain media for internal communication in the companies that are using collaboration software:

A Media-Synchronicity Theory based Explanation

Master thesis, 15 HEC, INFM10 in informatics

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Presented on June 3rd 2014

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Abstract

Collaboration Software is widely used in internal communication in the companies today. Software itself enables the companies to use variety of media with different properties and capabilities to mediate the communication on different corporate tasks. The way companies use the communication media implies the overall company performance. This study empirically examines the general propositions of Media Synchronicity theory and its ability for providing the understanding for communication performance. Our research problem was identified in using a new context which has not been investigated before: Collaboration Software in the time where mobility is an extent. We developed hypothesis based on the propositions that communication performance will increase as a result of usage of media with different media synchronicity for the different parts of communication process, as suggested by MST. These hypothesis were tested using qualitative data analysis based on survey instruments developed for this study. The results of this research suggest confirmation and applicability of Media Synchronicity Theory in providing the understanding for the reasons of communication performance occurrence in the investigated companies. Moreover, there were some evidence which were challenging the general proposition of MST. These issues were discussed in this thesis as well.

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Table of Contents

1	Introduction	6
1.1	Background.....	6
1.2	Problem Area	8
1.3	Purpose of the study	9
1.4	Research Question	9
1.5	Delimitations	9
1.6	Terms and Definitions	10
2	Reviewing literature and theoretical starting-points	11
2.1	Media Richness Theory	11
2.2	Media Synchronicity Theory	12
2.2.1	Communication process	13
2.2.2	Redefined Task.....	13
2.2.3	Media Synchronicity and Media Capabilities	14
2.2.4	Conclusions about capabilities	15
2.2.5	Appropriation from familiarity with task, media and each other	16
2.3	Previous empirical researches using MST.....	18
3	Research Model.....	20
4	Method	23
4.1	Research Type	23
4.2	Research Approach.....	24
4.3	Research Strategy	24
4.4	Data Collection	25
4.4.1	Literature review	25
4.4.2	Sources of primary data.....	26
4.5	Development of semi-structured interviews.....	26
4.5.1	Design of interview guides.....	27
4.5.2	Selection of interviewees	28
4.5.3	Interviewing	29
4.6	Data Analysis.....	31
4.6.1	Interviews transcription.....	31
4.6.2	Coding of transcripts	31
4.7	Research Quality and Ethics.....	34

4.7.1	Validity.....	34
4.7.2	Reliability.....	35
4.7.3	Generalizability.....	36
4.8	Ethical aspects.....	36
5	Empirical results.....	37
5.1	Conveyance process and usage of low synchronicity media.....	38
5.2	Convergence process and usage of high synchronicity media.....	41
5.3	Conveyance process and usage of high synchronicity media.....	44
5.4	Convergence process and usage of low synchronicity media.....	45
6	Discussion.....	47
6.1	MST explanation of media usage in Collaboration Software.....	47
6.2	Inability of MST to explain media usage in Collaboration Software.....	51
7	Conclusions.....	53
7.1	Summary of research and empirical findings.....	53
7.2	Implications for practice.....	54
7.3	Limitations and further research.....	54
8	Appendix.....	55
8.1	Appendix 1.....	55
8.2	Appendix 2.....	58
8.3	Appendix 3.....	62
8.4	Appendix 4.....	67
8.5	Appendix 5.....	73
8.6	Appendix 6.....	78
9	References.....	80

Table of Tables

Table 1: Explanation of the crucial term abbreviations 10
Table 2: Propositions based on Media Synchronicity Theory as declared by Dennis et al. (2008) 16
Table 3: Previous researches applying MST 19
Table 4: Main hypothesis in the research model 21
Table 5: Comparison of selected media and their capabilities, adapted from Dennis et al. (2008) 22
Table 6: Keywords used for relevant literature searching 26
Table 7: Overview of interview data collection 30
Table 8: Coding scheme for interview data analysis 32
Table 9: Categories for coding 34
Table 10: Document sharing usage for conveyance process task 38
Table 11: E-Mail usage for conveyance process task 39
Table 12: Shared calendar usage for conveyance process task 40
Table 13: Social networking tool usage for conveyance process task 41
Table 14: Audio conferencing usage for convergence process tasks 42
Table 15: Face-to-face usage for convergence process tasks 43
Table 16: Instant messaging usage for convergence process tasks 43
Table 17: Video conferencing usage for convergence process tasks 44
Table 18: High synchronicity media usage for conveyance process tasks 45
Table 19: Low synchronicity media usage for convergence process tasks 46

Table of Figures

Figure 1: RESEARCH MODEL BASED ON DENNIS ET AL. (2008) MEDIA SYNCHRONICITY PROPOSITIONS 22

1 Introduction

This chapter will provide a clear level overview of the conducted study, providing a broad background to the Collaboration tools that companies are using. The chapter will clarify the study's core purpose, which is followed by a specific research question that forms the focus of this study. On the end, the chapter concludes with the study's limitations that were noted in order to ensure that the study was highly focused in its nature.

1.1 Background

The rapid development of the technology is constantly shaping and changing the way companies are working today. Due to globalization and the increased availability of online collaboration software, people are now likely to work together in settings where computers are their primary mode of communication (Giordano & George, 2013).

In the struggle for decreasing the costs and lowering the time of execution of activities, managers are obligated to discover new models of working, and the technology is their main partner in this trend (McFarlane, 1984). The complex working environment that the future is bringing can be achieved only with computer mediated communication (CMC) and collaboration software that will connect all the sides together, regardless of their current location. By Giordano and George (2013) as companies continue to become more global, more individuals works from home and more collaboration software is accessed online, the use of these communication tools will likely increase. By DeLuca and Valacich (2005) this is principally case for the international organizations that are expanding their geographic and temporal boundaries and simultaneously attempt to shrink communication costs.

In the fast moving markets, the need to get tasks completed ever faster, the pressures of the market and global recession driving down spending, becomes an increasing need for effective Computer-mediated communication to support virtual work (Grinter, Herbsleb, & Perry, 1999).

Collaboration software allows employees to collaborate via verity of communication mediums like video and audio conferencing, email, calendar, instant messaging, desktop sharing, social platforms and cloud databases. As these trends are taking considerable attention, in the

practice there is a need the impact of those tools to be explained by the academics. Collaborative software affects the communication performance and overall company performance. Prior research has argued and empirically demonstrated that the nature of the communication technology influence the type of performance that are ensued from its use (Bartelt & Dennis, 2014).

Another fact why collaboration tools start to be very popular in working environment is the development of the mobile technology and usage of the smartphones as portable computers. The increasing popularity of smartphones, tablet computers, and other mobile devices opens up new opportunities for communication and collaboration on business forecasts (Asimakopoulos, Boretos, & Mourlas, 2014) . In that way Collaboration supported by mobile devices has brought advantages for users (Guerrero, Ochoa, Pino, & Collazos, 2006). Unlike in the past, today most of the managers are spending the working time out of the offices. They are traveling, having meetings and monitoring the company activities. Having their smartphone or tablet with them, it is similar to compare it with option they are wearing the whole office wherever they are (Ai, Lu, & Deogun, 2008).

Increasing numbers of the companies are starting to have remote employees, or people that are working from home. According to Shah (2014), increasing number of American employees are working from home at least one day a week. This is a trend that could lower company's costs and boost productivity. Allowing employees to work from home can also lower a company's costs especially for real estate, given the reduced need for office space. And a 2008 study by Cisco Systems Inc. found that employees who work remotely experienced an increase in their quality of life. Moreover, Hughes and Bozionelos (2007) identified the problems caused by inability to balance work and non-work life as the main causes of job dissatisfaction, job turnover and absenteeism from the job.

Effective communication is critical to most organizational processes, counting team collaboration and decision-making (Berry, 2006). Face-to-face communication is commonly assumed to be superior to all other forms of communication, yet face-to-face communication does not cope well with organizational constraints such as time pressure or the geographic distribution of team members (Berry, 2006).

But what is the most important for the academia is the performance that companies are achieving with the usage of the communication channels that collaboration tools are offering. Moreover, how these existing media are combined with face-to-face communication and the usage of the mobile devices?

1.2 Problem Area

Communication using Information and Communication technologies have been making significant impact on task performance in organizations (Ryoo & Koo, 2010). It is of great importance for the companies to be able to measure the performance of communication processes in order to achieve the understanding of the factors which affect those performances. There are several theories, which try to present frameworks for evaluating the communication performance in organization. The theories are going to be presented in more detail in the following parts.

As will be shown in the forthcoming text, we have done a database research and identified that the area of Collaboration Software performance were not investigated using the Media Synchronicity Theory. From our academic article database research we have not found anything related to this. As the Collaboration Software is new and emerging field there is a need for communication performance explanation. Media Synchronicity Theory as presented later, gives as an academic framework to support our research in understanding the communication performance of Collaboration Software. We identify this knowledge gap of lacking the appli-ance of MST in explaining the Collaboration Software communication performance as a major problem area in our master thesis.

Computer-mediated communication (CMC) is any communication that occurs through the use of two or more electronic devices (Yu, 2011). Collaborative software or groupware is Computer-mediated communication through application software designed to help people involved in a common task to achieve goals.

Our academic motivation in this research is to test the applicability of the Media Synchronicity Theory MST in new context which has not been tested before. On the other side regarding the practical motivation of this problem, our research should give useful insights to help companies in the understanding the effects of different media types in Collaboration Software on overall communication performance, no matter if the software is accessed through desktop or any mobile device. We consider that the communication performance evaluation of Collaboration Software is important and represents something that needs to be explained in an academic research.

1.3 Purpose of the study

With our thesis we want to provide an understanding of the employee communication performance indicators in Collaboration Software. Our goal is to test the applicability of Media Synchronicity Theory on communication where apart of face-to-face communication, organizations are also using all the media channels that Collaboration Software is offering. Especially important fact is the doing of this study in a time where we are facing the trend of development in mobile and wireless ICT which is creating possibilities to work at any place and time (Andriessen & Vartiainen, 2006). But we need to notify that we are not putting the focus on mobile collaboration. In this study we analyze the overall communication of the companies that are using desktop and mobile collaboration tools conducted of many media channels.

The theory is proposing the influence that different media can have on communication performance in a group of people. We want to investigate if this theory can be used to explain its communication performance in this context. Furthermore, our thesis achievement will be presented in form of applying the MST and its usage in employee communication performance explanation in Collaboration Software.

1.4 Research Question

Regarding the background of the Collaboration Software, problem area that we identified and purpose of the research explained above, we are presenting our Research Question in the following form:

How does MST explain media choices for internal communication in the companies where Collaboration Software is used?

1.5 Delimitations

As main delimitation factor in our thesis we would like to note is the usage of set of media channels which were part of one or several collaboration tools. In our research we will not elaborate just the performance of Desktop Collaboration Software, neither Mobile Collaboration Software, nor analyzing the correlation between. We will analyze the overall communication of the companies that are using desktop and mobile collaboration tools conducted of many media channels. Important delimitation in our research was the condition of usage of mobile devices for collaboration inside the companies. Mobile was seen as the extension of the current Collaboration Software and its usage was in parallel with the usage of the regular version of the software.

This decision was made regarding the limited time and resources for this master thesis research. Our opinion is that it is better to convey a research, which can be properly finished in the planned time period, than to make it more complex by employing several software and compare their performances. This way we want avoid getting in trouble of not finishing the research on time. Our research will also be delimited to the companies headquartered in Sweden.

1.6 Terms and Definitions

Table 1: Explanation of the crucial term abbreviations

Term	Meaning
MST	Media Synchronicity Theory
CMC	Computer Mediated Communication
CSCW	Computer Supported Cooperative Work
MRT	Media Richness Theory
IM	Instant Messaging
VC	Video Conferencing

2 Reviewing literature and theoretical starting-points

In this chapter we will outline the frame of the field of study. We will provide introduction to the Media Synchronicity Theory MST, explaining the postulates of the model, the usage of the theory and present the theory propositions. On the end of the chapter we will present the previous empirical researches using MST, and will distinguish them from our area of study

Media capacity theories state that effective communication is more likely to be achieved by matching media characteristics with communication tasks (Hung, Duyen, Kong, & Chua, 2008). Two examples of these theories are Media Richness Theory and Media Synchronicity Theory which we are going to present in more detail in the following section. These theories have been used by practitioners to determine the effective use of communication medium as well as evaluate, design and select certain media. Both of these theories were considered by the authors when making the selection of one, which is more appropriate in this case.

2.1 Media Richness Theory

The main idea of MRT is that the information needs for performing a task should be matched with the medium's richness or "capacity to facilitate shared meaning" (Daft, Lengel, & Trevino, 1987). Where we have richness defined as the "ability of information to change understanding within a time interval" (Daft & Lengel, 1986). The theory states that media choice should be determined by matching the technology to the task (Task-Technology Fit). Media richness theory argues that certain media are better able to transmit information depending upon whether the information is used in situations of uncertainty or equivocality (Dennis & Valacich, 1999). According to MRT richer media should be used for tasks of higher uncertainty and complexity, while simple and uncomplicated tasks should be dealt with leaner communication media.

In order to promote communication efficiency, theory states that the purpose of communication is to reduce uncertainty and equivocality in order to promote communication efficiency. Uncertainty mostly is associated with the lack of information. Organization creates structures such as formal information systems, task forces, and liaison roles that facilitate the flow of

information to reduce the uncertainty. The role of media in uncertainty reduction is its ability to transmit the sufficient amount of correct information. Equivocality is associated with negotiating meanings for ambiguous situations. To deal with equivocality, people in an organization must find structures that enable rapid information cycles among them so that meaning can emerge (Daft & Weick, 1984). The role of media in dealing with equivocality is to enable the processing of rich information. Different media differ in their ability to convey rich information (Daft et al., 1987).

One weakness regarding MRT noted by DeLuca and Valacich (2006) is the theory being linear and static. As they explain MRT is only considering the immediacy of feedback and availability of verbal and non-verbal cues as the main criteria for complex tasks which makes face-to-face the richest medium. Results from an empirical research on computer-mediated and video communication found no support for the central proposition of media richness theory; results reported that matching media richness to task equivocality did not improve performance (Dennis & Kinney, 1998). Having in mind this findings we considered this theory as not applicable for providing a framework to explain the communication performance of Collaboration Software as it is considered a clear Computer Mediated Communication. In line with Dennis, Fuller, and Valacich (2008), we support the critic of Media Richness Theory where they state: “we have two options to improve on our understanding of media and performance: (1) refine MRT to address the weak findings with new media or (2) formulate a new theory that addresses the capabilities of new media”. In the following section Media Synchronicity Theory is going to be presented as an emerged theory from MRT.

2.2 Media Synchronicity Theory

As a result from the failure of MRT to be applied in new media, researchers have looked for an alternative theoretical approach to understand the interplay of teams and media for communication, particularly in attempts to solve business issues with little or no face-to-face communication. A theory which embraces the differences in preferred media for various stages of complex tasks and team maturity, and offers some explanation for the contradictory results from studies on virtual teams is media synchronicity theory (DeLuca & Valacich, 2006). This theory was first offered to explain the effective task performance when utilizing various media for communication process (Dennis & Valacich, 1999). The crucial difference on MST is stated in the work of (Dennis & Valacich, 1999) as divergence in communication effectiveness which is influenced by matching the media capabilities to the needs of the fundamental communication processes, not aggregate collections of these processes (i.e., tasks) as proposed by media richness theory. As the first version of MST was the evolution of MRT it has slightly different framework from the one which was presented later. The second version of MST presented in Dennis et al. (2008) expands the original theory by providing stronger theoretical basis for the constructs and relationships that make the theory. In this upgraded version authors identified new propositions that explain the relationship between media capabilities and synchronicity and how synchronicity is related to task communication requirements for communication performance. In the following part we will give a more detailed elaboration of

Media Synchronicity Theory which is accepted by the Information Systems researchers as a theory for making predictions about communication performance.

2.2.1 Communication process

First we would like again to point the important difference between MST to MRT in order to make a clear distinction between the two theories. We saw that in MRT the main concept is the task which is used to make accurate prescriptions about the best media to be used in order to improve the certain task performance (Dennis et al., 2008). Task is perceived as too broad conceptualization and is being redefined in MST. As a contrast, the primary thesis of MST is that the communication performance comes from the matching of media capabilities to the communication process required to accomplish a task, not the overall task itself (Dennis et al., 2008).

The term Communication is defined like two-way process of reaching mutual understanding, in which participants not only exchange (encode-decode) information, news, ideas and feelings but also create and share meaning (Hamid Rafiq Khattak). In the exchange process which is actually the sharing of information two important points are required, dissemination of information in order to develop meaning – information transmission and individual processing of that information – information processing (Dennis et al., 2008). Authors of MST identify two fundamental communication processes which are relevant to all tasks based on the needs to both transmit and process information: conveyance and convergence. Conveyance is defined as the transmission of diversity of new information – as much new, relevant information as needed – in order to give the ability to receiver to create and revise mental model of the situation. The process is referred to the gathering and dissemination of information combined with individual information processing to generate individual sense making. On the other side, the process of convergence is defined as discussion of preprocessed information about each individual's interpretation of a certain situation. The goal in this process is to achieve agreement on the meaning of the information. In order to achieve this goal individuals need to reach common understanding and to mutually agree that they have achieved the understanding. In other words, establishing of shared understanding (convergence) is the assessment of the overlap and similarity in conclusions drawn by others (Dennis et al., 2008).

2.2.2 Redefined Task

The main concept of media capability theories as we mentioned previously is redefined in MST. In the new perspective, task is redefined as the underlying conveyance and convergence process which according to Dennis et al. (2008) will enable more precise understanding of how media capabilities may enhance the communication process (in fact the development of shared understanding) by having impact on information transmission and information processing. This means that in order to understand the communication performance we need to look at the underlying communication process which is composed of conveyance and convergence as they are facilitated by the used media. Also important notion here is the understanding of how people use the media and how that use affects the success of communication. In

this case it is important to consider both the need to transmit information among the people as well as individual cognition needed for processing and understanding of that information (Dennis et al., 2008).

2.2.3 Media Synchronicity and Media Capabilities

So far, we presented the first building block of the communication performance according to MST. In the following paragraph we would like to present the other important constituent of MST. Media capabilities, together with communication performance and the fit between them, facilitate faithful appropriation which leads to better outcomes (Dennis et al., 2008). Important construct derived from the media capabilities is media synchronicity, which is defined as the extent to which the capabilities of communication medium enable individuals to achieve synchronicity (Dennis et al., 2008). Where synchronicity represents a state in which individuals are working together at the same time with a common focus (Dennis et al., 2008).

Media capabilities identified by the authors of MST are defined as the potential structures provided by a medium which influence the manner in which individuals transmit and process information (Dennis et al., 2008). These capabilities influence the media ability to support information transmission and information processing which determine the capabilities to support the synchronicity. The media capabilities presented in MST are grouped in one that support information transmission: transmission velocity, parallelism, and symbol sets. On the other side we have capabilities which support the information processing: rehearsability (encoding) and reprocessability (decoding).

From the previously presented characteristics of conveyance and convergence processes we could see that they have different requirements regarding information transmission and information processing, and synchronicity as a result. Same-time-same-place communication such as face-to-face one are highly synchronous, while different-time-different-place communications such as e-mail are of low synchronicity with differing capabilities (DeLuca & Valacich, 2006). This can be explained as high synchronicity association with reduced cognitive effort to encode and decode messages, that way yielding faster message transmission. In that situation message can be assessed and modified quickly, even during the transmission process. On the other side lower synchronicity is derived from the decreased level of interaction between sender and recipient (Dennis et al., 2008). It is more suitable of the conveyance process as individuals do not need to work together at the same time. In the conveyance process the main goal is to transmit large amounts of information and it requires more time to access and deliberate on the information.

Five media capabilities proposed by Media Synchronicity Theory are explained below.

Transmission velocity is the speed at which the medium can deliver the message to the intended recipients (Dennis et al., 2008). High transmission velocity provides reaching of the recipient as soon as the message is sent and also that message is characterized with spending less time in transmission process. This characteristics support the improved coordination,

quicker feedback and shared focus among individuals working together which leads to support of synchronicity.

Parallelism is the extent to which signals from multiple senders can be transmitted over the medium simultaneously (Dennis et al., 2008). This media capacity impacts the synchronicity as it increases the number of transmissions which occur at the same time and supports multi-directional communication. It is typical in new media as the volume of information that can be transmitted in a given time period is increased. Therefore, parallelism affects the ability to develop a shared focus (Dennis et al., 2008).

Symbol sets represent the number of ways in which a medium allows the information to be encoded for communication process (Dennis et al., 2008). People can communicate in physical, visual, verbal and written way. Certain symbol sets can affect the information transmission and processing because of the time needed to encode or decode particular symbol set. In short we can say that symbol sets represent the format by which information is conveyed, cost of delays in order to alter or compose a message on a certain medium, and social costs of lack of symbols (DeLuca & Valacich, 2006).

Rehearsability is the extent to which the media enables the sender to fine tune during encoding, before sending it (Dennis et al., 2008). Rehearsability may create delays in transmission process as senders can take more time to compose the messages. The delay regarding this issue in situations where fast response is expected affects the coordinated behavior and focus and affects the synchronicity.

Reprocessability is the extent to which the medium enables message to be processed again at the time of decoding, either in the process of communication or after the event has passed (Dennis et al., 2008). This capability is important for the information processing process as it gives the ability to the receiver to reexamine in the content and understand it better, especially when the new and large volume of information is transmitted. It is particularly important for the process of conveyance as the needs for processing of information are greater (Dennis et al., 2008). Similarly to previous capability delays in message transmission are common when the reprocessability is the case and impairs the development of coordinated behavior and focus, which affect the synchronicity negatively.

2.2.4 Conclusions about capabilities

MST proposes that previously explained five media capabilities affect the information transmission, information processing, and synchronicity. In our case, regarding our research we have to point out that the important issue to consider is the capability of the Collaboration Software will depend upon the communication medium used (Dennis et al., 2008), not the device itself considered as single entity. Authors of MST also propose two important conclusions regarding the media capabilities and consideration of new, digital media. This directly affects our research and we will explain that in the following text. First conclusion is that the media are not monolithic. That means that one medium can possess different levels of communication capabilities (ex. Instant messaging systems have different symbol sets). Second

important conclusion regarding media capacities refer to the inability of a single medium to have best values for both information transmission and information processing. So MST proposed that the best medium for a given situation may be a combination of media (Dennis et al., 2008). Improved communication performance can be reached by balancing the strengths and weaknesses of media.

2.2.5 Appropriation from familiarity with task, media and each other

In MST three contexts in which communication occurs which are: familiarity that individuals have with each other, with the task and with the communication media they use. To support a certain communication process individuals will most probably employ both conveyance and convergence and according to the suggestion of the theory they will use mix of media to achieve satisfactory level of communication performance (Dennis et al., 2008). When the individuals have experience with the task, media and each other they will need less convergence. This way they will require media which supports lower level of synchronicity. On the other side the individuals with less experience with task, media and each other will require more convergence and thus the need of media with higher synchronicity. Important thing to mention here is the time dimension which refers to the fact that over time communication context will move from novel to familiar. Thus, over time individuals will have less need for the high synchronicity media. Based on the MST propositions we will create our theory testing hypothesis.

Table 2: Propositions based on Media Synchronicity Theory as declared by Dennis et al. (2008)

Propositions from MST

<p><i>P1 – Main proposition regarding communication performance</i></p>	<p>Communication performance will depend on the fit between a medium's synchronicity and the fundamental communication processes being performed.</p> <p>(a) For communication processes in which convergence on meaning is the goal, use of higher synchronicity media will lead to better communication performance.</p> <p>(b) For communication processes in which the conveyance of information is the goal, use of lower synchronicity media will lead to better communication performance.</p>
<p><i>P2 – Proposition regarding media capabilities which influence media synchronicity</i></p>	<p>Transmission velocity improves shared focus, which will have a positive impact on a medium's capability to support synchronicity.</p>
<p><i>P3 - Proposition regarding media</i></p>	<p>Parallelism lowers shared focus, which will have a</p>

<i>capabilities which influence media synchronicity</i>	negative impact on a medium's capability to support synchronicity.
<i>P4a - Proposition regarding media capabilities which influence media synchronicity</i>	Media with more natural symbol sets (physical, visual, and verbal) have a greater capability to support synchronicity as compared to media with less natural symbol sets (written or typed).
<i>P4b - Proposition regarding media capabilities which influence media synchronicity</i>	Using a medium with a symbol set better suited to the content of the message will improve information transmission and information processing, and therefore will have a greater capacity to support synchronicity.
<i>P5 - Proposition regarding media capabilities which influence media synchronicity</i>	Rehearsability lowers shared focus, which will have a negative impact on a medium's capability to support synchronicity.
<i>P6 - Proposition regarding media capabilities which influence media synchronicity</i>	Reprocessability lowers shared focus, which will have a negative impact on a medium's capability to support synchronicity.
<i>P7 - Proposition regarding familiarity of individuals with task, media, and each other</i>	<p>Although individuals working together on tasks will benefit from the use of both high and low synchronicity media, their need for media synchronicity will depend on their level of familiarity with each other, with the task, and with the media.</p> <p>(a) Individuals working together with well-established norms working on familiar tasks using familiar media will have the least need to use media supporting high synchronicity.</p> <p>(b) Individuals working together without well-established norms working on unfamiliar tasks using unfamiliar media will have the greatest need to use media supporting high synchronicity.</p>

MST proposes that the communication performance will be improved when the needs of conveyance and convergence process are matched to appropriate media with the transmission velocity, parallelism, symbol sets, rehearsability and reprocessability needed by those processes (Dennis et al., 2008).

2.3 Previous empirical researches using MST

From the literature exploration we discovered that MST was used before in a similar context to our proposed research, testing the choice of communication media in virtual groups across two separate organizations (DeLuca and Valacich, 2006). The research in this paper was conducted in different action research groups where the groups used two different asynchronous electronic communications media. In this research Media synchronicity theory was utilized in order to hypothesize the interplay of media capabilities, task communication processes and team functions (DeLuca & Valacich, 2006). The study provided a strong support to media synchronicity theory when it comes to media performance testing in new media. This research was conducted before 2005 where the usage on mobile devices for in-company collaboration was not taken into consideration. Compared to this research in our thesis we want to test the communication performance in virtual teams, but this time our focus will be on the Collaboration Software which is used in the companies. As the software has many different media integrated, it will distinguish ourselves from the previous study which investigated particular media. Moreover, we are going to consider the trend of mobility as an emerging field.

In another study where the MST was used and tested we have contrasting outcomes. In this research the theory was tested using instant messaging (IM) as a new information and communication technology (ICT) (Hung et al., 2008). In this study the hypothesis were developed again from the media synchronicity theory. Surveys were used to collect the data from 81 users in 4 companies. The results of this study point out to the fact that although IM was perceived as highly synchronous communication medium it was not perceived to be as effective for convergence process as it was expected from the theory propositions (Hung et al., 2008). The results of this study call for refinement of media synchronicity theory.

Interesting study which we consider worth mentioning in this part is presented by Muhren, Van Den Eede, and Van de Walle (2009) which is focused on elaborating how media supports synchronicity in order to fit communication needs when making sense of humanitarian crises situation. Findings from this research are also contradicting MST in a way of dismissing the theory statements of using solely low synchronicity media to support conveyance process. According to them actors participating in conveyance communication process would rather use high synchronicity media.

Based on the previous empirical studies that we identified, our goal in the thesis will be to test the theory in new context and see its applicability for providing understanding of communication performance. Expected results of our studies could be in line with one of the previous studies conducted by researchers, we can prove and support the media synchronicity theory or we can disprove it in the context of Collaboration Software communication performance explanation.

Furthermore, in the table below we will present five more researches that are using the Media synchronicity theory (MST), in similar context. We are presenting the title of the study with short description. These papers were used by us for analyzing and studying the usage of Media synchronicity theory. As we stated previously, we did not find any research that is using this theory in a same study field like us.

Table 3: Previous researches applying MST

Study Title	Study short description	References
<i>“The Effect of Social Media on Tourism Destination Marketing: A Media-Synchronicity-Theory based Exploration”</i>	In this paper, they analyze the distinctive features of social media, and based on Media synchronicity theory (MST), they redefine the marketing as a series of communication processes, and elaborate the features of social media on supporting their synchronicity with tourism destination marketing.	Shengnan, Jinxing, Xiang, and Hongqin (2012)
<i>“Making Sense of Media Synchronicity in Humanitarian Crises”</i>	This paper focuses on how media should support synchronicity to fit communication needs when making sense of a humanitarian crisis situation. It evaluate the communication process and measuring the performance. Findings from interviews with senior management of humanitarian aid organizations in the Democratic Republic of the Congo show that, contrary to what is suggested by MST, low synchronicity media are not sufficient to support conveyance processes.	Muhren et al. (2009)
<i>“Reflecting the Choice and Usage of Communication Tools in GSD Projects with Media Synchronicity Theory”</i>	They are implementing Media Synchronicity Theory for analyzing the communication practices and the choice of media used for internal communication of the team in global software development projects. In GSD projects for different types of task they are using variety of communication media, such as teleconferences, email and instant messaging to overcome the challenges caused by the distances. They found evidence supporting applicability of media synchronicity theory in selecting communication tools for GSD projects.	Niinimaki, Piri, Lassenius, and Paasivaara (2010)
<i>“Virtual teams in and out of synchronicity”</i>	This paper is providing an understanding of process improvement team regarding the effectiveness of asynchronous e-collaboration of virtual teams. Media synchronicity theory was utilized to hypothesize the interplay of media capabilities, task communication processes, and team functions.	DeLuca and Valacich (2006)
<i>“Ten Red Balloons: Virtual Teams and Online Communities – a Test of Media Synchronicity Theory “</i>	This study investigates the validity of Media Synchronicity Theory, in predicting the performance of virtual teams in completing complex tasks, specifically teams whose members belong to an online community. This study provides evidence and shows support for the theory in predicting behavior that leads to efficient task performance amongst a virtual team.	Randall (2013)

3 Research Model

This chapter proposes a research model in which the Media Synchronicity Theory will be used in the context of explaining the performance of Collaboration Software inside a company. We will also define our hypotheses through which we are going to convey our research.

Based on the presented theory propositions we defined three hypotheses through which we are going to convey our research. The hypotheses are presented in our research model presented in figure 1. The hypothesis must contain a justified theoretical argument for the reasons why we expect a certain phenomenon to occur or do not occur (Recker, 2013).

In our research model the Media Synchronicity Theory will be used in the context of explaining the performance of Collaboration Software inside a company. In order to support the theory applicability we will need to prove the hypotheses, which we define as main theory testing hypothesis. These hypotheses are the factors, which directly influence the communication performance. The factors represent multivariate constructs generated from communication process and media synchronicity.

Regarding our first hypothesis, we based it on the P1a from Table 1 where it is stated that the communication performance will be improved if the media used for conveyance process is media with low synchronicity. In our second hypothesis we follow the statement from the P1b in Table 1 where the MST states that the performance of the communication will be improved if in the case of convergence process media of high synchronicity is used. In sum, our first two hypothesis state that the phenomenon of increased communication performance in separate communication processes will depend of using the media with proper media synchronicity associated with that process.

In our case the first two hypotheses refer to proving of the third one which is dependent from the previous two. In fact if first two hypotheses are true than the third one is true as well. The third hypothesis is based on the P1 from Table 1, where the fit between technology and task needs to be achieved in order for the communication performance to be good. That proposition is in line with the task-technology fit model theory which focuses on the task characteristics, technology features and how these two fit to influence performance (Fuller & Dennis, 2009). This proposition in Media Synchronicity Theory is based on the previous logic. In our particular case it would be the fit between medium's synchronicity and the fundamental communication processes being performed.

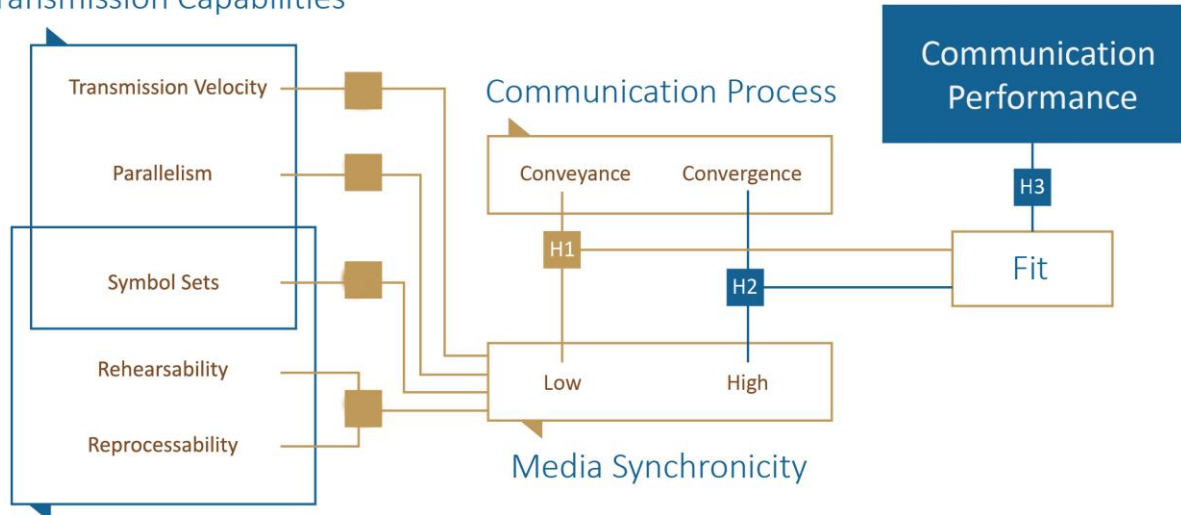
Table 4: Main hypothesis in the research model

Hypothesis statements	
H1	Communication performance is positively affected by usage of low synchronicity media for conveyance process
H2	Communication performance is positively affected by usage of high synchronicity media for convergence process
H3	Communication performance is affected by using multiple media for different communication process

As it was elaborated in the theory review part there are factors which affect media synchronicity as a major communication performance construct. Those factors refer to the media capabilities which influence the media synchronicity. Media capabilities are expressed in a range from low to high values. Every single media capability has its influence on the media synchronicity and their impact can be either positive or negative. That means that the higher values of the media capability measures could increase or decrease media synchronicity. Important issue to be noticed here is the effects which different media capabilities have on the ability of media to support information transmission and information processing. In order to make a clearer explanation of this, we suggest figure 1, where our research model is presented. On the left side of the picture we have all five media capabilities presented. Here we can notice that the media capabilities are grouped in two separate diagrams which refer to capabilities which either support transmission or processing of information during the communication process. On the research model it can be also noticed that of symbol sets media capability belongs to both groups of categories as it has its effects on two of them simultaneously.

In sum, in our research model we have three hypotheses which are derived from Media Synchronicity Theory. The three hypotheses elaborate the applicability of MST. If we manage to prove these hypotheses we are going to confirm the applicability of MST in providing understanding of communication performance of Collaboration Software. Moreover, the theory constituent Media Synchronicity will be explained in detail through the five media capabilities which are defined in two groups, one of them supporting information transmission other supporting information processing in communication. A detailed presentation of the media capabilities for the media presented in our research is presented in table 5 below. With the media capabilities presented below we will show the factors which influence the media synchronicity and elaborate the effects media capabilities has on media synchronicity in our data set.

Transmission Capabilities



Processing Capabilities

Figure 1: RESEARCH MODEL BASED ON DENNIS ET AL. (2008) MEDIA SYNCHRONICITY PROPOSITIONS

Table 5: Comparison of selected media and their capabilities, adapted from Dennis et al. (2008)

	Transmission Velocity	Parallelism	Symbol Sets	Rehearsability	Reprocessability	Information Transmission	Information Processing	Synchronicity
Face-to-Face	High	Medium	Few-Many	Low	Low	Fast	Low	High
Video Conference	High	Medium	Few-Medium	Low	Low	Fast	Low	High
Telephone Conference	High	Low	Few	Low	Low	Fast	Low	Medium
Synchronous Instant Messaging	Medium-High	Low-Medium	Few-Medium	Medium	Medium-High	Medium	Low-Medium	Medium
Synchronous Electronic Conferencing	Medium-High	High	Few-Medium	Medium	High	Medium	Medium	Low-Medium
Asynchronous electronic Conferencing	Low-Medium	High	Few-Medium	High	High	Slow	High	Low
Asynchronous electronic mail	Low-Medium	High	Few-Medium	High	High	Slow	High	Low
Voice Mail	Low-Medium	Low	Few	Low-Medium	High	Slow	Medium	Low
Fax	Low-Medium	Low	Few-Medium	High	High	Slow	High	Low
Documents	Low	High	Few-Medium	High	High	Slow	High	Low

4 Method

This chapter commences by providing a detailed overview of the data collection mechanism that we will employ in order to obtain the study findings. We will describe the data collection methodology that will be put into practice when conducting the necessary interviews with the various interviewees. Further on, the chapter will conclude by asserting the procedures engaged in order to certify that the study was of a necessarily high quality, with the validity, reliability, generalizability and ethical elements all methodically addressed.

4.1 Research Type

Depending on the purpose of the research and the data that is collected and analyzed, research type can be classified in three types: exploratory, descriptive and explanatory and depending on the research questions a research project can be both descriptive and explanatory (Bhattacharjee, 2012; Saunders, Lewis, & Thornhill, 2007)

According to Bhattacharjee (2012) exploratory research is often conducted in new areas of inquiry, aims to find out the magnitude or extent of a particular phenomenon, issue, or behavior, then to generate some initial ideas about that phenomenon, or to test the feasibility of undertaking a more extensive study regarding that phenomenon.

A descriptive research by Saunders et al. (2007) could be a further step of exploratory research or a part of explanatory research. Bhattacharjee (2012) suggests that descriptive research directs at making careful observations and detailed documentation of a phenomenon or an interest.

On the end we have the explanatory research, and most academic or doctoral research belongs to the explanation category (Bhattacharjee, 2012). Explanatory research, on the other hand, refers to the study of a situation or a problem in order to explain the relationships between variables (Saunders et al., 2007). Explanatory research seeks explanations of observed phenomena, problems, or behaviors and while descriptive research examines the what, where, and when of a phenomenon, explanatory research seeks answers to why and how types of questions (Bhattacharjee, 2012).

Our research is aiming to test the applicability of Media Synchronicity Theory in environment where the teams are having internal communication with using a set different of desktop and mobile collaboration tools. Our study is also measuring the performance of communication in the companies that are using a collaboration applications trying to understand the effective-

ness of the communication process for different types of tasks. So considering the nature of this study and the types of our research question, this research belongs to the type of explanatory study.

4.2 Research Approach

Choosing an appropriate research approach is highly dependent on the nature of the research purpose, which is also crucial for the researcher to define a proper strategy afterwards (Saunders et al., 2007). Scientific research mainly draws attention on two research approaches: inductive or deductive (Bhattacharjee, 2012). By the same author in inductive research the goal of a researcher is to infer theoretical concepts and patterns from observed data. On the other side, in deductive research, the goal of the researcher is to test concepts and patterns known from theory using new empirical data. In other words inductive research is theory-building research, while deductive research is theory-testing research.

In our study we are testing Media Synchronicity Theory. The model of the theory already exists, but we are testing it with new empirical data that were never used with this theory. Actually, we want to achieve validation of the theory, and to test it in practice in certain conditions. The approach of deduction can be viewed as an attempt to test concepts and patterns known from theory using new empirical data, so our approach in the study is deduction.

We chose to work with a deductive model because we are testing existing theory, with new data collected from interviews. In deductive as suggested by Bhattacharjee (2012) the aim is theory-testing research, where the goal of the researcher is to test concepts and patterns known from theory using new empirical data. Moreover, the purpose was to measure performance of the communications of the users as well as to test the hypotheses within the proposed model, instead of building a new theory.

4.3 Research Strategy

According to (Saunders et al., 2007), research strategies include experiment, survey, case study, action research, grounded theory, ethnography and archival research. These research strategies can be applied for descriptive, exploratory, explanatory research or combo ways.

In our thesis we use a qualitative strategy for conducting our research. Qualitative Strategies by Recker (2013) book are defined as procedures that feature research methods such as: case study, ethnography or phenomenology and which are characterized by an emphasis on qualitative data. The data in our study was collected through semi-structured interviews, method of a survey.

According to (Recker, 2013) a survey is defined as gathering information about the characteristics, actions, perceptions, attitudes, or opinions of a large group of units of observations (such as individuals, groups or organizations) .

One of the main reasons why we decide to make a survey is the fact that survey strategy is considered as more economical because of less time, effort and cost compared to other strategies (Bhattacharjee, 2012).

Survey strategy is a compelling way for measuring unobserved variables such as preferences, perceptions and behaviors (Bhattacharjee, 2012). As Recker (2013) states exploratory surveys ask about the relations between variables often on the basis of theoretically grounded expectations about how and why the variables ought to be related. In our research we are exploring the behaviors of people to use a different channels of communications for different tasks.

In the survey method explained by Bhattacharjee (2012) different techniques can be used, such as mail questionnaires, online questionnaires, interviews, or less frequently through structured interviews or published statistics. In our studies we decide to use face-to-face interviews, where they worked directly with the respondents and ask questions and record their responses. We decide to do interviews since our target group in the research is the companies, and in order to understand the system of communication of the companies, longer conversation with the managers were required.

4.4 Data Collection

Broadly speaking, in our research we used the positivist method for data collection. In line with Bhattacharjee (2012) positivist methods are used to theory testing and positivist designs seek generalized patterns based on an objective view of reality. In the context of our research where we implement an Information Systems theory and use it to explain the communication performance of Collaborative Software this approach for data collection seems reasonable. As Media Synchronicity Theory was not used before in explaining the communication performance of Collaborative Software we also want to test the applicability of this theory, which argues our positivist method approach for data collection.

4.4.1 Literature review

Randolph (2009) explains that conducting a literature review is a means of demonstrating an author knowledge about a particular field of study, including vocabulary, theories, key variables and phenomena, and its methods and history. Guided by this statement we focused our attention to the proper investigation of the prior studies where the Media Synchronicity Theory was used as a theoretical framework.

In order to conduct a search of prior literature, we have used Lund University Library, Google Scholar and several online digital library databases (ACM Digital Library, Web of Science and IEEE Xplore Digital Libraries). With combinational usage of these sources we were able to collect huge amount of information, which was in the researched field. Numerous academic papers were collected and saved in a centralized shared repository in a cloud service where it was grouped in several categories according to the associations we created. This data helped

us to design and conduct a proper scientific research. In the table below we present the keywords we used to search for the relevant literature for our study.

Table 6: Keywords used for relevant literature searching

Keyword	Keyword
Collaboration Software	Computer Mediated Communication
Collaborative Software	Media Synchronicity Theory
Virtual Teams	Media Capability Theories
Communication Performance	Media Richness Theory
Testing Media Synchronicity Theory	Media Theory
Collaboration Technology	Electronic Communication

4.4.2 Sources of primary data

Authors of this thesis managed to collect primary data with the support of several companies located in Sweden. Companies were distributed throughout various industry sectors.

For the purpose of the qualitative data collection, as we elaborated, we used semi-structured interviews. The goal here was to see if the users are acting according the recommendations that Media Synchronicity Theory is suggesting, when it comes for usage of different media available inside Collaboration Software, and to provide understanding about the performance of the companies. Furthermore, media capabilities that each media poses defined the usage of the media as different media are used for different communication processes.

To provide structure for the interviews we used several method course-books in Information System Research. Mostly our design of interviews was based on books from Bhattacharjee (2012), Hevner and Chatterjee (2010) and (Kvale & Brinkmann, 2009).

Data was collected from the employees inside the companies, which used the Collaboration Software on daily basis conducting their everyday activities. They were familiar with all the capabilities and features the software offers as they were experienced users.

4.5 Development of semi-structured interviews

We thematized our data collection separating the main questions in the interview in three main groups. Questions regarding conveyance process were categorized together, then convergence process questions were categorized in another group and at the end we made a group of questions which referred to mobile usage of collaboration software.

We are looking for the fit between media chosen and communication process involved. With the interview we want to identify the factors which prove or disprove our hypothesis.

4.5.1 Design of interview guides

For the purpose on ensuring the guidance for the semi-structured interview we developed an interview guide (presented in Appendix 2). With these guide we aimed to ensure that the interview questions in the guide pointed out to knowledge production, and creation of positive interview interaction (Kvale & Brinkmann, 2009). We used this guide as a template for the process of performing the interviews. During the interviews there were slight variations of the questions posted to the respondents as the conversation went in several contexts throughout the different employees in the companies. In the guide itself, questions related back to our proposed research model were presented. Questions inside our interview guide were sorted into three main categories: introduction, main section and closing questions. Important acknowledgement before starting the interview was the informing of the respondent about the recording of the interview and get the confirmation that we are allowed to record the interview.

In the introduction section we presented our self to the respondents and they presented themselves. We asked questions regarding the company they work at in order to make the respondents comfortable and set the scene. By asking these straightforward questions at the start of the interview respondents were enabled to get ready for the upcoming questions (Kvale & Brinkmann, 2009). The main part of the interview was divided in two subcategories each referring to a certain communication process either conveyance or convergence. For this purpose the main part of the interview was based on several scenarios where respondents were asked to say how they behave in certain situation. Namely, questions reflected various situations which respondents are facing daily during the usage of the collaboration software for communication with colleagues. In the first subgroup of questions regarding conveyance process we designed the situations according to the explanation of the conveyance process in the seminal paper on Dennis et al. (2008) where it was pointed as a process where the transmission of large volume of information is conducted and participants needed more time to achieve individual understanding based on that information. Furthermore, in the conveyance process the transmission of information was not urgent. On the other side, we had scenarios where convergence process situations were designed and the respondents were asked to point which media use then. For the convergence process it was important to have situations where small quantity of information is transferred back and forth in order to achieve shared understanding between communication participants as explained by Dennis et al. (2008) in Media Synchronicity Theory. The ending questions of the interview were meant to ensure that we had all the information necessary to progress with the research study (Kvale & Brinkmann, 2009).

4.5.2 Selection of interviewees

We conducted a series of interviews in four big companies from Sweden, mostly market leaders in their industry, with a high level of internal communication. This was done in order to obtain the necessary information for conducting the research and explaining the performance of Collaboration Software inside a company.

We ensured that we only targeted companies that had personnel with substantively significant experience within the IT and communication department. An overview of the interviewee backgrounds and their associated organizations is detailed below:

Alfa Laval

www.alfalaval.com



Alfa Laval focuses on energy optimization, environmental protection and food production. With more than 1900 patents, Alfa Laval is a leading global supplier of products and solutions for heat transfer, separation and fluid handling through their key products – heat exchangers, separators, pumps and valves, launching between 35 and 40 new products every year. Alfa Laval's worldwide organization helps customers in nearly 100 countries to optimize their processes. They have 28 major production units (15 in Europe, 8 in Asia, 4 in the US and 1 in Latin America).

The company has some 16 000 employees, the majority of whom are located in Sweden, Denmark, India, China, the US and France.

Egmont Publishing

www.egmont.com

EGMONT
We bring stories to life

The Egmont Group is one of Scandinavia's leading media companies. Owners of 36 Cinemas in Denmark and Norway, publishers of magazines, books, movies, TV serials, comic books, schoolbooks, games and game consoles. They publish in more than 30 countries.

In 2013 Egmont generated revenue of EUR 1.6 billion, and achieved its operating profit of EUR 191 million. The group owns more than 130 companies around the world. The history of Egmont starts in a modest little apartment in one of Copenhagen's smaller suburbs in 1878. And today Egmont comprises companies, which are involved in over 150 different aspects of media. Egmont Publishing which was a respondent in our research, publishes a wide range of formats for children of all ages: storybooks, annuals, colorings, activity and sticker books as well as a wide range of novelty books.

Seavus AB

www.seavus.com



Seavus® AB Sweden, is a software development and consulting company with a proven track-record in providing successful enterprise-wide business solutions. The company is among the 5 biggest companies in Malmö, with over 550 employees worldwide. Seavus has experience of over 14 years, offering a variety of products and service, successfully covering the European and US market from several offices in the world. Their expanding portfolio covers: BSS/OSS, CRM, CEM, Business Intelligence solutions, ALM, embedded programming, mobile and gaming solutions, managed services, as well as custom development, consultancy and resourcing. Seavus portfolio includes over 3,000 customers, among which leading worldwide telecoms and handset manufacturers, organizations from banking and finance industry, consumer electronics, technology, education, government, health, etc. Seavus has 10 offices around the world, located in 7 countries, with the headquarters in Malmö.

Fair Enterprise Network

www.fairenterprise.net



Fair Enterprise Network is a medium size Swedish software company, operating in Sweden and Nepal with headquarters in Stockholm. They are building and operating companies with social responsibility as a core principle. Firms combine business with ethical and democratic values. Fair Enterprise Network works to build businesses that are contributing to sustainable development in Nepal.

4.5.3 Interviewing

Once the potential interviewees within the various companies were confirming the interviews, we were defining convenience time and date suitable for the both sides, in order to implement the interviews.

Before all the meetings were enforced, we were providing the interview guide to all the interviewees, on their request. A brief overview of our conducted interviews with the representatives from the companies is presented in table 7 below:

Table 7: Overview of interview data collection

Respondent Name	Respondent Company	Respondent Role in Company	Interview type and location	Length
<i>Vasil Gocevski</i>	Seavus AB	Vice President of Sales	Face-to-face Malmö	1h 19 minutes
<i>Oskar Schultz</i>	Egmont Publishing	Head of Business Applications	Face-to-face Malmö	43 minutes
<i>Joshi Hemant</i>	Fair Enterprise Network Sweden AB	Office Manager for Nepal	Skype Nepal	45 minutes
<i>Jasmina Culibrk</i> <i>Karolina Tolvsgrård</i>	Alfa Laval AB	Web Collaboration Manager Innovation Facilitator	Face-to-face Lund	1 hour

Three of the interviews were conducted in a face-to-face model, as it can be seen from the table above, except the interview with Fair Enterprise Network that was made over Skype. We were insisting on face-to-face, since semi-structured interviews are obtaining better results when conducting face-to-face interviews (Kvale & Brinkmann, 2009). With regards to the interview that was conducted via conference call, this was done due to the fact that it was not possible to schedule face-to-face meeting, since the contact person left for Kathmandu, the capital of Nepal and our schedule was not allowing us to wait for him to come back in Sweden.

So we decided to implement the interview through conference call because “a telephone interview provides the best source of information when the researcher does not have a direct access to individuals” (Creswell, 2007)

Three of the interviews were conducted in English language and one with Seavus, on Macedonian language, since the Sales Director in the headquarters in Malmö is from Macedonia. During the interviews we were following the interview guide, but also with the follow up questions we were trying to gather more data, as much as we can (Kvale & Brinkmann, 2009).

Two recording devices recorded all the interviews, and one of us was taking notes. We have done it on this way in order to protect us from data lost. For recording the Skype conference call we used the software VodBurner.

For three of the interviews conversations we prepared verbatim, word-by-word transcription suggested by Kvale and Brinkmann (2009). Only for the interview with Seavus we prepared summary of the interview. This was done in this form, because the interview took more unof-

ficial atmosphere and the respondent was changing the topic frequently. So in order to focus on the findings we frame it in a summary, in order to get raw text data for content analysis.

4.6 Data Analysis

When the interviews were conducted we started to transcribe the recordings. Transcriptions were completed in several days after the interviews which enabled us to still have the discussions fresh on mind. Data analysis includes the preparation and organization of the data for analysis, then reducing the data into themes through a process of coding, and representing the data in tables and in form of discussion (Creswell, 2007).

4.6.1 Interviews transcription

Transcribing of the interview is identified as the first post interview stage followed by analyzing, verifying and reporting of the knowledge produced by interviews conversation (Kvale & Brinkmann, 2009). Transcribing of interview is conceived as transformation of the oral interview conversation into a written text amenable to analysis (Kvale & Brinkmann, 2009). We followed this statement and conducted the process of transformation in order to be able to properly analyze the empirically collected data. As the transcripts are going to be used in looking for evidence confirming the hypothesis stated in our research model we perceived this process as equally important to the interviewing itself. Verbatim transcriptions were considered as appropriate for the analysis. In line with this issue we want to mention that four of the interviews were conducted on English and we followed the verbatim transcription approach, while the only interview conducted on Macedonian language was summarized and main points were presented in the transcription. For the recording procedure we used the common way of audio recording with smartphones. In order to avoid misinterpretations in the transcripts we used two recorders placed in different parts of the room where the interview was conducted. Audio recording frees the interviewers to concentrate on the topic and dynamics of the interview (Kvale & Brinkmann, 2009). In our case we have several person who worked on transcribing of the interviews. The procedures for typing were same for all transcribers and written instructions were communicated to the transcribers together with audio files as suggested by Kvale and Brinkmann (2009). When the transcriptions were conducted authors of the thesis checked the content of the transcripts and identified its relation to the previously suggested procedures.

4.6.2 Coding of transcripts

For the purpose of coding the transcripts from our interviews we decided to use the open coding technique. With the open coding technique we have broken down the empirically collected data. As Corbin and Strauss (1990) explained in their work, the goal of the open coding is to give the analyst new insights by breaking inside standard ways of thinking about or interpreting of a phenomena which is reflected in the data. This technique is accompanied by constant comparison of the codes aimed to search for similarities and differences (Recker, 2013).

There are several analytic tools and approaches for analyzing interview transcripts and all of them contain specific demands to interviews transcriptions (Kvale & Brinkmann, 2009). Regarding the mode of interview analysis our decision was to choose analysis focusing on meaning. According to Kvale and Brinkmann (2009) meaning interpretations are focused on small segments of interview interaction which is the case in our data analysis. For this purpose we have developed codes which involve attaching of keywords to a specific segment in the text with the goal to allow later identification of that statement (Kvale & Brinkmann, 2009).

Coding scheme was created based on concept driven approach in advance by the researchers. Codes were assigned to every possible situation of media choice and communication process matching as presented in the table 7 bellow. The codes are composed of four alphabetic characters with two characters dedicated to communication process (either conveyance or convergence) and two characters dedicated to media used in the process. E.g.: CYEM –conveyance process and usage of e-mail.

This coding procedure helped us to cover all possible situations of using the media in the communication process. Our task in the analysis of the empirical data is to identify the communication process and type of media used in that communication process and match it with proper code from the suggested table. This way we are going to identify the circumstances in which different respondents communicate and later on try to explain their communication performance with the lens of Media Synchronicity Theory. Findings are presented into detail in the empirical findings chapter of the master thesis.

Table 8: Coding scheme for interview data analysis

Communication process and medium matching	Code
Conveyance process and usage of e-mail	CYEM
Conveyance process and usage of document sharing	CYDS
Conveyance process and usage of shared calendar	CYSC
Conveyance process and issue tracking tool	CYIT
Conveyance process and usage of video conferencing	CYVC
Conveyance process and usage of instant messaging	CYIM
Conveyance process and usage of audio conferencing	CYAC
Conveyance process and usage of face to face	CYFF

Conveyance process and usage of social networking tool	CYSN
Convergence process and usage of e-mail	CGEM
Convergence process and usage of document sharing	CGDS
Convergence process and usage of video conferencing	CGCV
Convergence process and usage of instant messaging	CGIM
Convergence process and usage of audio conferencing	CGAC
Convergence process and usage of face to face	CGFF
Convergence process and usage of shared calendar	CGSC
Convergence process and usage of social networking tool	CGSN
Convergence process and issue tracking tool	CGIT

Categorizing the interview can provide the overview of large amounts of collected data and facilitate comparisons and hypothesis testing which is the case in our research (Kvale & Brinkmann, 2009). Coding into previously defined categories can provide separation of occurrence and non-occurrence of the phenomenon, in our particular case it is the supporting or non-supporting the hypothesis suggested by the research model. Categories were designed on two levels, one pointing to the previous mentioned supporting and non-supporting of the theory while other categories are grouping media according to their media synchronicity. The first group of categories which we created are based on supporting the hypothesis about using a media with particular synchronicity for the certain communication process. Also the other group of categories apply to putting together all high and low synchronicity media usages in separate categories. This means that the previous codes based on a certain media usage in the communication process are now categorized in a more general category based on the synchronicity of the media. Categories and the codes in which they are distributed are presented in table 9.

Table 9: Categories for coding

	Conveyance process	Convergence process
<i>Low synchronicity media</i>	CYLSM	CGLSM
<i>High synchronicity media</i>	CYHSM	CGHSM

Computer programs can facilitate the analysis of interview transcripts (Kvale & Brinkmann, 2009). In the process of the analysis and matching of the codes in the transcripts we used nVivo software for qualitative data analysis as suggested by Bhattacharjee (2012). We had a previous experience of using this software in both courses of Business Intelligence and Research Methods. The procedure of computer analysis of an interview is explained by Kvale and Brinkmann (2009) as reading through the transcripts and coding the relevant passages while those passages can be retrieved and inspected over again in the later stages of analysis.

4.7 Research Quality and Ethics

Achieving trustworthiness, strength and transferability of social research is very much related to the concepts of reliability, validity and generalization (Kvale & Brinkmann, 2009). We are presenting explanation for each of these concepts along with our description how we address the elements in our study in order to enhance its quality. In addition, we also discuss the ethical aspects relating to this study are carefully described, presenting the reader full transparency with esteems to this critical element.

4.7.1 Validity

Validity is pursued with the aim of enhancing a study’s quality (Norris, 1997). Knowing this, it is very important to note that validity enhancing performs do not ensure that research is accurate, correct, certain, trustworthy or objective and there are no guarantees from which truths can be derived (Norris, 1997).

Validity may be categorized as being internal or external by nature (Seale, 1999). Internal validity is defined as “the extent to which causal propositions are supported in a study of a particular setting (Seale, 1999). On the contrary, external validity concerns the extent to which causal propositions are likely to hold true in other settings, an aspect of the generalizability of findings (Seale, 1999).

In our study we attempted to follow to the three principles of data collection suggested by (Yin, 2009), which is including: using of multiple sources of evidence, creating a study data base, and maintaining a chain of evidence.

As we explained before we conduct our data through semi-structured interviews in four different companies, using collaboration for internal communication. Further on we applied the investigator triangulation approach, as there were two of us working in each of the processes throughout our study. Secondly, we create the database by storing all the data from the interview records and the transcripts. Interview guide and the transcripts are all presented in Appendices 1 - 5.

On the end, supporting the third principle of data collection suggested by (Yin, 2009), we created a chain of evidence and define a linkages between the primary objectives of our study and the action that we took in order to achieve the objectives.

Other approach that we used to ensure the quality of our work include peer and supervisor reviews. On the pre final seminar three other peers of our colleagues checked our work, reviewed and discussed together within three of our supervisors and professors of Lund University. According to the feedback received, adjustments to our report were made.

Deciding regarding the number of interviews that carried out in order to obtain the necessary information that enabled our research study to be completed, we faced with the dilemma. We were not sure what number of interviews is enough to give us sufficient data, but facing the issue of time consume for transcription process followed by Kvale and Brinkmann (2009), we decide it to stop on four. We felt that we had the necessary information in terms of quality and quantity in order to fully answer our research question.

4.7.2 Reliability

Kvale and Brinkmann (2009) discuss attempts by qualitative researchers to distinguish qualitative studies from quantitative concepts by using terms such as credible and dependable, and how validity in qualitative research does not just involve measuring what needs to be measured but extends to whether the data reflects the phenomenon and area of interest of researches. By (Kvale & Brinkmann, 2009), reliability is demonstrating that the operations of a study such as the data collection produced can be repeated with the same results. This is achieved through thorough documentation of procedures and appropriate recording keeping.

There are a number of different ways within, which reliability may be addressed (Silverman, 2013). So in order to increase the quality of our research, we followed several principals.

Two devices recorded every interview, and one of us was taking notes of the most important facts said by the interviewers. We re-listened twice over all of our interview recordings, and we identify and remove discrepancies that were present due to the poor recording quality that was present in certain passages (Kvale & Brinkmann, 2009). Three interviews were made in person, in the offices of the companies that were part of our research, and only one was made over Skype, since our interlocutor was in Nepal. So, the line noise over the Skype interview made the transcription of certain segments more of a challenge and we had to re-listen carefully in order to ensure that our transcript was reliably accurate.

We used open questions rather than direct questions in our interviews, allowing interviewees to express their opinions, and not just to choose the offered answers.

4.7.3 Generalizability

By (Bhattacharjee, 2012) external validity or generalizability refers to whether the observed associations can be generalized from the sample to the population or to other people, organizations, contexts, or time. As we already explain, we conduct our research in companies that are communicating through different collaboration applications.

All the interviewees come from companies based in Sweden, operating in the same economic, political and social context.

To insure the transferability of our findings we provide a detailed description of our methodology for collecting and analyzing the empirical data.

4.8 Ethical aspects

According to Kvale and Brinkmann (2009) ethical issues are encountered during the development of an interview investigation. This principle we follow from the beginning of the process of collecting data, and we made a code of conduct the tracked continuously.

In our research we address four fields of ethical uncertainty suggested by Kvale and Brinkmann (2009): informed consent, confidentiality, consequences and the role of the researcher.

We contact more than 50 potential companies in Sweden, offering to participate in our research. First with sending an email to the official email address of the company and then reminding them with a phone call. In the introduction mail that we sent, we were explaining the purpose of the study as well as the methodology and the theory that we will use in the research. Some of the companies called us on introduction meeting asking more information and scheduling interview for another term.

The interview guide was send only to the companies that agreed to participate in the study. Following the ethical standards of the beginning of every interview we summarized our research purpose, asked express permission to record the interviews and obtained the informed consent (Creswell, 2007) of all our interviewees before conducting the interviews.

Also we informed all our interviewees for the option of confidentiality of interview. Most of them asked to check the content on the study before it will go in public.

Lastly, prior to proceeding to the interview, participants were inquired for any questions from their behalf, to prevent any ambiguities. Once the interviews were carried out, to assure the confidentiality of interviewees, we have depersonalized all the interview data detaching any details that might probably identify the interviewees, as suggested by Kvale and Brinkmann (2009).

5 Empirical results

This chapter will deliver an explanation of the examination of the thesis empirical findings that were obtained as a result of conducting a series of interviews with department managers in four big Swedish companies. We present tables that are showing the results gained for qualitative research, with an overall analysis, concisely detailing the key findings.

The empirical findings of this research are presented by presenting the answers of the key topics that have emerged from the interview data using the coding structure detailed in table 7: Coding scheme for interview data analysis, in the sub-heading 4.7.2 (Coding of transcripts). The results are categorized in four main topics which are in line with MST and explained in Table 8: Categories for coding: (1) Conveyance process and usage of low synchronicity media, (2) Convergence process and usage of high synchronicity media, (3) Convergence process and usage of high synchronicity media, and (4) Convergence process and usage of low synchronicity media. The results are set out in a way that they serve as a test for our hypotheses (Recker, 2013).

Relevant direct quotations are provided for each code in the situations where we had many evidence regarding the same code. Furthermore in situation where we did not have much empirical evidence for occurrence of certain phenomena tables were presented in form of containing all the codes which belong to certain category. Data which is put into table cells was derived from the coding in qualitative data analysis software nVivo 10. Verbatim versions of the interview transcripts are available in the Appendix part as well where the codes identified are presented in a separate column.

Sections 5.1 and 5.2 elaborate the results which belong to the category of MST supporting evidence while 5.3 and 5.4 sections are not in line with MST propositions. Regarding the fact that we identified 53 pieces of evidence which can be explained with the MST we will devote more space to them in our empirical results part. On the other side we identified 8 pieces of evidence where the media was used not in accordance to MST propositions. This sections will be shorter as there are not much findings to be presented, but the findings in this part are equally important compared to the ones which are in line with MST. From the findings which are not explainable with MST we will try to present some points of improvement for MST based on our data set.

In this section by the suggestion of Recker (2013) we only present our finding by factual result reporting, and without discussing or interpretation of the findings. The empirical data collection process which we conducted gave us the results which we needed in order to test the

previously defined hypothesis in our research model. Moreover the results are going to serve us to answer our research question, which we defined in the beginning of this thesis.

5.1 Conveyance process and usage of low synchronicity media

The first group of findings are identified as the usage matching of low synchronicity media for the conveyance process in the internal communication through the Collaboration Software used in the respondents companies. Table 10 represents the findings which we obtained from our research connected with document sharing usage for the conveyance process in the companies. The evidence identified in this case suggests on usage of Microsoft SharePoint, JIRA, Microsoft Lync, Dropbox, file server and similar tools which offer document sharing inside the companies. These tools were used in process where users wanted to convey larger amount of data and the individual understanding was expected from the recipients in the communication (Dennis et al., 2008). Document sharing is considered to be low synchronicity media as suggested in table 5, back in the qualitative data analysis part.

Table 10: Document sharing usage for conveyance process task

CYDS Conveyance process and usage of document sharing	
<i>Seavus</i>	<p>Document collaboration:</p> <ul style="list-style-type: none"> • They are using SharePoint. They cannot edit the document simultaneously. If someone is working on it, the other cannot open the document. They need solution for this.
<i>Egmont</i>	<p>Document collaboration:</p> <ul style="list-style-type: none"> • If it is outside my team, we use Microsoft SharePoint, if is in my team, we use JIRA. Jira gives such an option. • Sky drive is another tool that we looking to share documents and however it is not working well as we have seen it. • We have a lot of other app or systems that help us with editorial process, meaning that we have large system to handle if a magazine is composed and there is PDF generated, that is taken care by quite an advanced system. <p>Sharing minutes from the meeting:</p> <ul style="list-style-type: none"> • Usually we put the summary documents in folder and then send out on Lync saying that it is an update in this folder. • On the other side with SharePoint we are able to invite certain members to access this folder.
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • Recording trainings and share those videos among employees.

	<ul style="list-style-type: none"> • In group collaboration on a shared document, you make draft and then the other college can access the actual file and make changes,
<i>Fair Enterprise Network Sweden</i>	<p>Sharing files:</p> <ul style="list-style-type: none"> • So all the specification all the documentation all the images, all things can be updated in this software and we can link to Dropbox also, so it is connected to Dropbox also, so mainly we use Dropbox and Teamwork for like sharing files between Sweden and here. • Time server which we use to share different documents so we have one copy in our office and in online also we have normally all the documents also. So if document is big we use the file server, because with Dropbox will take a lot of time to link the file. • Normally we are using Dropbox for this purpose.

Table 11 below summarizes the findings about the usage of another low synchronicity medium for the conveyance process during the communication in the companies. In this case we had electronic mail as medium where we identified 6 occurrences of respondents pointing to the usage of this medium in the conveyance process.

Table 11: E-Mail usage for conveyance process task

CYEM Conveyance process and usage of e-mail

<i>Seavus</i>	<p>Sharing minutes from the meeting:</p> <ul style="list-style-type: none"> • They are sending minuets on mail after every meeting. They don't record the meetings.
<i>Egmont</i>	<p>Scheduling a meeting:</p> <ul style="list-style-type: none"> • Yes, they receive invitation for events on email. • Otherwise I email them. We have a policy in my group stating that we should be accessible meaning that most of the staff are checking their emails regularly.
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • I still receive a lot of emails with attach, check this version of the document what I have done.
<i>Fair Enterprise Network Sweden</i>	<ul style="list-style-type: none"> • Scheduling a meeting: Via email

Next situation refers to the usage of other low synchronicity media which actually belongs to asynchronous electronic conferencing media. Usage of shared calendar as a medium for

communication in the companies is a common issue. With the shared calendar employees can see each other schedules and organize meetings based on that. Also respondents stated that they usually attach documents to the event agendas so the participants at the meeting will be able to prepare themselves better.

Table 12: Shared calendar usage for conveyance process task

CYSC Conveyance process and usage of shared calendar

<i>Seavus</i>	<p>Scheduling a meeting:</p> <ul style="list-style-type: none"> • For scheduling physical or online meeting they are using Microsoft exchange. The software is recommending terms where everyone is free to attend on a meeting, booking meeting rooms that are free in that term, and sending calendar invitations and emails to everyone that need participate in the meeting.
<i>Egmont</i>	<ul style="list-style-type: none"> • In that case we use calendar functions from Microsoft with outlook, so that's further common used. • Yes, they confirm their attendance through the calendar function. • We are looking at possibility to use shared calendars from JIRA, or some other tools, but it is little bit in a future, currently the outlook and exchange functions are good enough for us. • Make a calendar request (have meeting there and there) we arrange the meeting
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • With calendar, and if you want to invite somebody we use the calendar invite and also Lync. • Yes, it is very transparent, their calendars are also available.
<i>Fair Enterprise Network Sweden</i>	<ul style="list-style-type: none"> • So for regular meetings we use Microsoft outlook meeting calendar and every time we have a meeting we get a notification and we go to the meeting room and make the meeting.

In this part of presenting the evidences from our research we have an interesting new media. It is enterprise social networking tool which belongs to the category of asynchronous electronic conferencing media. It is characterized with slow information transmission and high information processing capabilities according to the Table 5. As such we identified the usage of this tool in the companies in context of organizing a system for knowledge sharing inside the company where employees are encouraged to share their achievements and successful stories. Moreover in one of the companies it was stated that the users use the enterprise social network to arrange meetings.

Table 13: Social networking tool usage for conveyance process task

CYSN Conveyance process and usage of social networking tool

<i>Seavus</i>	<ul style="list-style-type: none"> • No comments
<i>Egmont</i>	<ul style="list-style-type: none"> • No comments
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • But, where I can pose and find information, that would be in a data base knowledge of the company, as an access point when it comes to that.
<i>Fair Enterprise Network Sweden</i>	<ul style="list-style-type: none"> • For like regular milestone meeting we use Teamwork, because when you set the milestone it automatically gives a notification.

5.2 Convergence process and usage of high synchronicity media

In this section of the thesis we are presenting the findings about the usage of high synchronicity media in the convergence process. High synchronicity media by Dennis et al. (2008) are face-to-face media communication channels like video and audio conferencing or phone calls as suggested by table 5. Synchronous instant messaging is considered for high-medium synchronicity media and synchronous electronic conferencing is considered for medium synchronicity media.

Convergence process, as we defined above, is a process of discussion of preprocessed information about each individual’s interpretation of a certain situation. The goal in this process is to reach common understanding and to mutually agree that they have achieved the understanding. In other words, establishing of shared understanding (convergence) is the assessment of the overlap and similarity in conclusions drawn by others. (Dennis et al., 2008)

In the interviews transcript data we located 24 examples that are confirming the case of usage of high synchronicity media for convergence process. Companies mentioned four types of high synchronicity communication channels that they are using for internal communication: audio conferencing [CGAC], face-to-face [CGFF], instant messaging [CGIM] and video conferencing [CGVC]. Therefore we divide our findings in four coded categories.

Table 15 is presenting the findings, which we obtained from our research connected with audio conferencing usage and phone calls for the conveyance process in the companies. Followed by the communication strategies of the companies, to keep record of every official company conversation, generally they are avoiding to use phones for regular communication and usually are using emails or intranet platforms like SharePoint and Lync. The biggest usage of phones or software mediated audio conferencing, by our findings can be located in urgent tasks and fixing technical issues.

On fixing technical issues, big companies are usually communicating with maintenance departments through ticketing systems. But, by the findings, if the issue cannot be removed with instructions in written form, usually entities are establishing direct contact over phone. For fixing technical issues two companies stated that they are using the collaboration tool Jira.

For regular calls, company Alfa Laval is using the collaboration tools Microsoft Lync, and the company Seavus for international calls is using 3DX central phone calling application.

On the question regarding the usage of mobile for video conferencing, company Egmont answered that on the crowded places they are preferring more audio conferencing over mobile, instead of video, because of the destruction.

Table 14: Audio conferencing usage for convergence process tasks

CGAC Convergence process and usage of audio conferencing

<i>Seavus</i>	<ul style="list-style-type: none"> • If they cannot fix the technical problem through Jira, then they are using phone or Skype.
<i>Egmont</i>	<p>Fixing technical issue:</p> <ul style="list-style-type: none"> • Because we are large company, we of course need to have good support structure. There is a service desk function. Which is able to receive calls either if call or email. • My group is actually one of those entities and we use something call Jira service task which is also one of Jira packages and they are able to basically log a call. <p>Further on if there is a need for discussion in live, they usually call they don't use Skype or Lync for that type of communication, they usually use a regular phone. They usually use a regular phone.</p> <p>How do you communicate when out of the office:</p> <ul style="list-style-type: none"> • If it is an emergency and I need to call one of my employees I try to call them on a phone. It is not always easy at the airport to seat in a video conference with people while planes are flying around in the back, it can be destruction for the rest of them. In those situations it is more common to use only audio conferencing without video elements included.
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • We use Microsoft Lync for regular calls, <p>Fixing technical issue:</p> <ul style="list-style-type: none"> • Also we have number its 1717, that you call and a person comes.
<i>Fair Enterprise Network Sweden</i>	<ul style="list-style-type: none"> • For the regular weekly meetings on the relation Sweden-Nepal we use the Skype and sometimes we use phone also.

Table 15 is presenting the usage of the face-to-face communication for convergence process, companies notify that they still prefer to have all the people in the same room, so everybody can get the sense and understanding [Alfa Laval]. But in order to save money for traveling costs, they are replacing face-to face with video conferencing. From the company Fair Enterprise Network, stated that video conferencing is not replacing in total the face-to face communication, so they still frequently are traveling in order to meet with the colleagues from other countries. In order to keep record of the discussion Alfa Laval prefers to record the internal physical meetings.

Table 15: Face-to-face usage for convergence process tasks

CGFF Convergence process and usage of face-to-face

<i>Seavus</i>	<ul style="list-style-type: none"> No comments
<i>Egmont</i>	<ul style="list-style-type: none"> We have a lot of face-to-face communication.
<i>Alfa Laval</i>	<ul style="list-style-type: none"> Prefer to have all the people in the same room, so everybody can get the sense and understanding,
<i>Fair Enterprise Network Sweden</i>	<p>Meetings:</p> <ul style="list-style-type: none"> Having only Skype meeting sometimes isn't enough and we go to Sweden and have a meeting there. But normally from Sweden the project manager comes to Nepal to discuss issues for important projects

In Table 16, we are presenting the usage of Instant Messaging (IM) for convergence processes. Companies prefer to use Instant Messaging. Some of them are using Skype as an official IM for two-ways communication. From Alfa Laval stated that they are using the IM option of Lync. The only disadvantage of the Lync's IM pointed by Alfa Laval, is the shortage of option for recording the conversation or history feature.

Table 16: Instant messaging usage for convergence process tasks

CGIM Convergence process and usage of instant messaging

<i>Seavus</i>	No comments
<i>Egmont</i>	No comments
<i>Alfa Laval</i>	<ul style="list-style-type: none"> First one what you just said instant messaging
<i>Fair Enterprise Network Sweden</i>	No comments

Table 17 is presenting the answers on set of questions, where the interviewees replied that in convergence processes they are using video conferencing as a part of specific collaboration tool. Testing the use of video conference in environment where companies personnel are using mobile, brought us to findings that the usage is rapidly increasing. One of the companies, for regular or urgent types of meeting is using video conferencing, mostly using Skype or the collaboration tool GoToMeeting, while the others are using Lync or Skype. Last company is using video conference also for their real time online trainings.

Table 17: Video conferencing usage for convergence process tasks

CGVC Convergence process and usage of video conferencing

<i>Seavus</i>	<p>Performing a video conference:</p> <ul style="list-style-type: none"> • Talking on Skype or “go to meeting”. • Skype
<i>Egmont</i>	<ul style="list-style-type: none"> • If is internal meeting with my team, we usually use Skype or Lync • We can have a video conference by Lync or Skype and between that.
<i>Alfa Laval</i>	<ul style="list-style-type: none"> • We also use very often Lync for conducting trainings. • But on my way home in my car I prefer doing it, rather than skipping the meeting, its commuting in between it via video conference.
<i>Fair Enterprise Network Sweden</i>	<ul style="list-style-type: none"> • The main communication is with Skype, we have a Skype group meeting

5.3 Conveyance process and usage of high synchronicity media

In this section of the thesis we are presenting the findings about the usage of high synchronicity media in the conveyance process. As it was stated in MST conveyance process is characterized with exchange of larger volume of information and its goal of achieving individual understanding is taking considerable amount of time. Having this in mind MST proposes the usage of media with low synchronicity which will enable the participants in the conveyance communication process. This means that the users do not need to work with shared focus and in same time while communicating. In this situation we have the opposite case, usage of high synchronicity media for the conveyance process and represents a situation where MST is not capable of explaining the communication performance.

According to the data collected with the interview we conducted and which is summarized in the table 18 below we can explain the following examples. Based on our empirical data we can say that there were two issues in our interviews where the respondents talked about usage of media with high synchronicity for conducting the conveyance process. In the first example

we identify the usage of instant messaging which was used for setting up a meetings in one of the companies. In the other example of usage of higher synchronicity media we have the same situation in another company, where users also tried to schedule a meeting using in this case video conferencing.

Table 18: High synchronicity media usage for conveyance process tasks

	CYAC Conveyance process and usage of audio conferencing	CYFF Conveyance process and usage of face to face	CYIM Conveyance process and usage of instant messaging	CYVC Conveyance process and usage of video conferencing
<i>Seavus</i>	No comments	No comments	No comments	No comments
<i>Egmont</i>	No comments	No comments	No comments	No comments
<i>Alfa Laval</i>	No comments	No comments	Instant messaging is equally heavily used for setting up meetings	No comments
<i>Fair Enterprise Network Sweden</i>	No comments	No comments	No comments	other meetings normally like for tomorrow suddenly we need a meeting tomorrow at 2pm we communicate with Skype

5.4 Convergence process and usage of low synchronicity media

Findings regarding the situation where we have the usage of low synchronicity media for conducting a conveyance process are presented in the table 20 below. As we can see in the summary of the findings gathered from qualitative data analysis using NVivo 10 there are only several pieces of evidence, which refer to the occurrence of this situation. In the first situation we identified usage of e-mail in conducting a convergence process that is reporting the issue to the technical department. According to the explanation from the interviewee in one of the companies when the technical equipment or software issue is not urgent they use e-mail to report it to the technical department which later on deals with the problem. The other finding regarding the usage of low synchronicity media usage in the convergence process was identified with applying the capabilities of issue tracking tool for the situation of requiring help from the technical department staff. Actually the identified situation refers to the usage of

ticketing tool for reporting the technical issue to the specialized department where different levels of line support deals with the reported problem. In our last identified case where the low synchronicity media was used in a form of asynchronous electronic conferencing as defined by Dennis et al. (2008) we recognized the usage of enterprise social networking tool for dealing with convergence process in the internal communication. In one of the cases we had the reporting of a technical issue one more time and in the other case we identified the usage of social networking tool when employees wanted to discuss the document content on which they were supposed to work on.

Table 19: Low synchronicity media usage for convergence process tasks

	CGDS Convergence process and usage of document sharing	CGEM Convergence process and usage of e-mail	CGIT Convergence process and issue tracking tool	CGSC Convergence process and usage of shared calendar	CGSN Convergence process and usage of social networking tool
<i>Seavus</i>	No comments	No comments	No comments	No comments	Discussing the content of the documents which need to be prepared are communicated using SN tool Confluence
<i>Egmont</i>	No comments	We are sending email to service desk department to report technical issues Get emails from other systems about technical issues	No comments	No comments	No comments
<i>Alfa Laval</i>	No comments	No comments	We do have ticket system, and we have first line support second line support or third line support	No comments	No comments
<i>Fair Enterprise Network Sweden</i>	No comments	No comments	No comments	No comments	Teamwork, in that system we can update will get assign the person from technical department

6 Discussion

This chapter provides an in-depth analysis of the results obtained through the empirically conducted investigation. The findings obtained from the four conducted interviews are related back to the hypothesis defined in the research model of this thesis. The discussion itself is divided into two fragments as detailed in the continuation

In the discussion part of our thesis we are going to interpret the data gathered and elaborate our findings which we reported in the previous section (Recker, 2013). The main findings identified in our research were gathered from qualitative data analysis. In the analysis we tested the hypothesis which were derived from Media Synchronicity Theory. As our main finding we want to stress the confirmation of the hypothesis tests and achieving ability for MST to explain the communication performance in the companies regarding the usage of Collaboration Software. Our findings suggest that the communication performance inside companies which use collaboration software is increased if they use different media for different communication process.

In our research model we presented the reasons why we wanted to collect the empirical data and the goals we wanted to achieve. Based on that two of our main categories, one of the categories was based on grouping the codes that suggested support for the hypothesis in the research model, while on the other side we had the other two categories which united the codes which were not in line with our hypothesis in the research model.

6.1 MST explanation of media usage in Collaboration Software

As we defined earlier in the methodology section on the thesis we conducted the open coding analysis and defined 18 codes for different possible matching situations. Situations were based on the matching on the usage of certain media for a specific communication process inside a company. All codes were classified in four general groups which referred to the type of media synchronicity (either low or high) and the matching with the communication process (conveyance or convergence) as presented in Appendix 6. In this section of the discussion we will focus on the two categories where we had the most evidence referring to. Those two coding categories are: low synchronicity media usage for conveyance process and high synchro-

nicity media usage for convergence process. In this two categories we identified the evidence which was in line with MST.

Within the category of low synchronicity media usage for conveyance process we had coded 30 findings referring to the occurrence of this phenomena. In text below we are presenting in detail findings discussion about each code together with the applied media capabilities explanations of why this phenomena occurred. As it was stated in the previous section where we presented our empirical findings, we identified many pieces of evidence which referred to the usage of media with low synchronicity for the conveyance process tasks. The media used in those situations was manifested in the form of: e-mail, document sharing, shared calendar, issue tracking and social networking tool. In our discussion as we mentioned above we are going to apply the five media capabilities suggested by MST which influence the level of media synchronicity. Through five media capabilities suggested by Dennis et al. (2008) and presented in table 5 we will try to explain the occurrence of the certain situations.

In the first case where document sharing was used for the situations where the conveyance process takes place we can say that information transmission capabilities were not very important compared to the information processing capabilities of the medium. Namely, when users wanted to share their documents in form of reports or summary of the minutes from the meetings they used the software functions which enable file sharing. Transmission velocity was not a crucial capability in this situations as the speed of transmitting the information was not the factor for choosing the media. Furthermore, parallelism of this medium is high as suggested by Dennis et al. (2008) and presented in table 5. This means that several messages can be transmitted at the same time, more particularly several documents can be shared simultaneously. That lowers the shared focus and affects the synchronous working. This two values of media capabilities suggest the presence of low synchronicity media. Moreover on the other side rehearsability and reprocessability had high values which was recognized by the employees who used the Collaboration Software. These two values also refer to the low synchronicity media presence. Our situations where we asked about the usage of the medium were designed to refer to conveyance process of the communication which was conducted either on desktop or mobile device. In the cases in our interviews it was stated that the Collaboration Software where document sharing was present as a medium has the mobile version which was regularly used by the employees.

Next situation was usage of e-mail for the conveyance task performing communication. This medium has similar capabilities compared to document sharing. It means that transmission velocity was again low while parallelism was high. Speed of delivering the information to the recipient was not crucial in this case for the senders, also the ability to have multiple conversations was the case in the usage of this medium. On the other side capabilities of rehearsability and reprocessability further explain the low synchronicity of the media. These capabilities are beneficial to the employees as they take their time during the coding process and also have the needed time period when they read the e-mails and get the information from there. Following the e-mail usage we had the shared calendar, some functions interrelate between these two media in the Collaboration Software. Furthermore, our respondents reported the usage of mobile devices for checking their e-mail on daily basis. Compared to this situation the

e-mail notification which were received on a mobile device about the track changes of the shared documents where he works together with his colleagues was a very appreciated functionality

Our last situation was the usage of social networking tool. This emerging new Collaboration Software gave the ability for one of the companies to share their knowledge from their employees. In this case MST would explain it as need for rehearsability and reprocessability capabilities for by employees who use this software. With this capabilities employees would benefit from the knowledge shared by previous experiences of their colleagues and will be able to retrieve that knowledge at any time in future. Moreover, the capabilities of transmission velocity is not considered a requirement as the information in this cases is not needed immediately. Also parallelism of this media is high which enables simultaneously content creation by different employees, that way lowering the synchronicity.

Under the category of low synchronicity media usage for conveyance process we had coded 23 findings referring to the occurrence of this phenomena. In text below we are presenting in detail findings discussion about each code together with the applied media capabilities explanations of why this phenomena occurred in the situation we asked our respondents about the usage of the certain media. The media used in those situations was presented in the form of: audio conferencing, video conferencing, face-to-face and instant messaging. In our discussion as we mentioned previously we are going to apply the five media capabilities suggested by MST which influence the level of media synchronicity. Through five media capabilities suggested by Dennis et al. (2008) and presented in table 5 we will try to explain the occurrence of the certain situations.

First of the situations where we had usage of higher synchronicity media for the convergence process was presented through the usage of audio conferencing media. Audio conferencing media were present in several Collaboration Software tools and were commonly used by the interviewed employees. Having in mind the high media synchronicity of audio conference as a media, MST explains the usage of this particular media in the convergence process. In fact, the usage of audio conferencing enables fast transmission of information, moreover the inability of medium to support parallelism leads to shared focus between the persons which communicate. Inabilities for audio conferencing to support rehearsability and reprocessability of the messages lead to lower information processing capabilities which are characteristic of media with high synchronicity. In the situations where respondents used audio conferencing their goal of the communication process was to establish a shared understanding with the other communication participant. This finding is completely in line with the proposed theoretical explanation suggested by MST and described in Dennis et al. (2008).

Other investigated situations suggests to the usage of face-to-face communication in the convergence process. MST explains this through its propositions of usage of high synchronicity media for the convergence process tasks. Consequently, higher media synchronicity is derived from the capabilities which this media possess. Namely, this media has the highest media synchronicity of all media which we identified in our collected interview data. The capability of transmission velocity is on high level with this medium, this suggests the usage in the circumstances where messages needed to be transmitted very fast and assure that the recipient

gets that message. As the fast response is needed in order for the shared meaning to be achieved this capability confirms its importance in the cases of convergence process tasks. Furthermore, parallelism is on a lower level as it is only limited number of participants who can communicate simultaneously during face-to face conversation. These characteristics together with lower levels of reprocessability and rehearsability of the information processing suggest the higher synchronicity of this media. That means conversation participants need to work on same time with the shared focus in order to achieve the shared understanding required by the convergence process. This exactly were the cases which we identified in our empirical data for the usage of this certain media in convergence process tasks asked in our interview questions. MST achieves to provide understanding about the reasons why this particular media was used in the given situations.

Next finding which we derived from our data set and needs to be discussed here is the usage of instant messaging in the situation of convergence process. It is a commonly used media in companies today, mostly with the integrated function of instant messaging in Microsoft Lync Collaboration Software. Their usage of this medium is possible to be explained with the media capabilities which are presented by MST. Transmission velocity is defined to be on medium-high level which means that this medium can provide pretty fast transmission of the information. Next capability of IM defined by MST is parallelism which in this medium is on low-medium level. That suggests that the messages not too many can be transmitted simultaneously because of the needed shared focus by the communication participants. These characteristics lead to higher media synchronicity Moreover capabilities of rehearsability and reprocessability hold medium-high values for this medium which refers to a satisfying level of information processing capabilities. Those capabilities will give communication participants enough time to encode and decode the messages which again leads to higher media synchronicity. As we can see from the MST explanation this media has higher level of synchronicity which makes it suitable for usage in the convergence process situations which was case in our empirical data set.

The last identified media which takes part in this discussion section would be the usage of video conferencing as a media integrated in Collaboration Software and being used for the convergence process tasks. Video conferencing represents a pure high synchronicity media, very similar one to face-to face communication. The only difference compared to face-to-face communication is the number of symbol sets available for encoding the message. Video conferencing offers slightly less symbol sets as physical contact is still not available during the communication. Other capabilities such as transmission velocity on a high level which give this medium rapid exchange of information, while on the others side limited parallelism confirms the high media synchronicity. Furthermore the low levels of rehearsability and reprocessability capabilities of this medium make them inefficient for processing of large volumes of information. As it was shown in our data set patterns, the respondents from the companies where we did the interviews use this media mostly for convergence process tasks. The usage of mobile devices for video conferencing through Collaboration Software was a common issue in situation where respondents were on the airports or in a car driving. They did not prefer video conferencing because of the background destructions and preferred usage of audio conferencing through their mobile devices in those circumstances.

All of the above elaborated situations referred either to the usage of media with low synchronicity for conveyance process or usage of high synchronicity media for convergence process. These findings are referred to the H1 and H2 respectively and represent evidence for confirming those two hypothesis. Furthermore as we defined earlier, if the first two hypothesis were confirmed, that means the usage of low synchronicity media for conveyance process was identified and usage of high synchronicity media for the convergence process was the case, we can conclude that H3 is also confirmed. H3 stated that the usage of different media for different communication purposes will lead to higher communication performance in the companies. This was the case in our companies as they did not report any crucial issues within their communication process. Moreover, we would like to add here the fact that the companies are pretty successful in the fields in which they work and most of them represent market leaders in their industry. With this evidence in mind we can say that we answered the research question which we posted at the beginning of our thesis. Main theory hypothesis were confirmed and MST was able to provide the understanding of the communication performance in the Collaboration Software as it was elaborated in the section above.

As we saw in our interviewee selection section our companies were market leaders in their industry segment so we perceive that the communication performance are on a high level. Having this and the previous discussion in mind we can say that MST was able to explain the communication performance inside the companies where we conducted the interviews. This means that according to our data set Collaboration Software communication performance can be explained with Media Synchronicity Theory. To be more precise, we can say that the usage of different media for different parts of communication process as suggested by MST will increase the communication performance in companies using the Collaboration Software.

Our addition to the body of knowledge in the Information System is demonstrated in the form of extending the applicability of MST in understanding Collaboration Software. This conclusion is derived from the data set which we have collected for the purpose of this scientific research.

6.2 Inability of MST to explain media usage in Collaboration Software

Compared to the previous category for supporting the MST hypothesis in this section we are going to discuss the findings which were not in line with the proposed theory. This findings refer to the usage of media with high synchronicity for the conveyance process as well as usage of media with low synchronicity for convergence process.

In our case we had usage of instant messaging or video conferencing for conveyance process where users wanted to arrange meetings through the mentioned media. The usage of this media is not explainable by MST as it suggests the opposite situation to occur. Media capabilities of this media explain the reasons for the media synchronicity and reasons why the specific media should be used in convergence process tasks. This evidence which we get to with our research is present in one previous research in Information Systems literature. Paper from

Hung et al. (2008) reports similar findings of effective usage of instant messaging for the conveyance process. In this research IM is considered more effective for conveyance communication than for convergence communication which did not support the MST perspectives. In line with this research we get some evidence which supports the statement of further refinement of MST.

The other set of evidence for the inability of MST to explain the media usage in Collaboration Software was identified in the convergence communication while using media with low synchronicity. The situation identified here refers to the usage of e-mail, issue tracking tools, enterprise social network platforms and shared calendar. Media capabilities as suggested by MST explain the presence of low transmission velocity in those media, which is not compatible with the requirements for the convergence process tasks. From the empirical results we derived evidence stating the rules which companies apply for usage of mobile devices. Rules were aimed to increase the transmission velocity of low synchronicity media and that way increase the level of low synchronicity media. This evidence was reported in one of the companies for the usage of e-mail on their mobile devices. Furthermore, high reprocessability and rehearsability of the media suggest the usage of it in the situation where messages need more time to be encoded and also recalled several times later.

This is not explainable by the main propositions of the theory, but the revised versions of MST suggest that the familiarity with the task, media and each other could lead to usage of media with lower synchronicity for convergence process (Dennis et al., 2008). When individuals are going to gain certain experience with the task, media and each other, it will be expected to use media which is supporting less synchronicity as fewer convergence process will be expected (Dennis et al., 2008). On the other side individuals who work without well-established norms on unfamiliar tasks will have the strongest need to use the media which is supporting high synchronicity. Unexpected results in research which was conducted using MST are explained by Dennis et al. (2008) as stated above.

7 Conclusions

In this section of our thesis we are providing a closing frame of the research we have conducted. Key contributions of the paper are summarized as well as the glimpse reflection of the research was presented. Key findings were related back to the introduction of the thesis where we have defined our problem area and research question.

7.1 Summary of research and empirical findings

In our master thesis we have conducted a research which aims to implement an Information Systems theory in providing the understanding of communication performance of Collaboration Software used for internal communication inside the companies, no matter if the software is accessed through desktop or any mobile device. Major research model was based on Media Synchronicity Theory, which provides a theoretical framework for explanation of communication performance.

In our research we used qualitative data analysis conducting interviews with representatives from companies. Those representatives were the ones which were in charge of internal communication departments in the companies or were on higher management positions. Data gathered from the interviews served us to test the hypothesis presented in our research model and answer the research question which we have suggested.

The main findings from our research suggest to the support of MST in explaining the communication performance of collaboration software which is approached either on desktop or mobile devices. This refers to the usage of different media for the different communication process. In fact, the majority of our findings were in line with the proposition of MST which point to the usage of media with low synchronicity for conveyance process of communication as well as usage of media with high synchronicity for convergence process of communication. Our main contribution with this study was the confirmation of theory propositions applicability in the context of Collaboration Software. Findings on our research provide an understanding of the reasons why employees used certain media in the Collaboration Software as viewed through the lens of Media Synchronicity Theory.

Moreover there were several pieces of evidence which suggested to the findings which were not in line with MST explanations. Those findings were not surprising as the previous researches happened to have the same contradicting evidence about the MST. We found the similarity in our findings to the findings on other researchers in the field. Furthermore, in our results there were several situations where the upgraded version of MST explain the occurrence of certain phenomena.

7.2 Implications for practice

Practical implication of our research is manifested in providing an understanding about the reasons for the increased communication performance in the companies using the Collaboration Software. Our research contains clear set of factors which refer to the increased communication performance. These factors are based on the insights gained of the higher level managers from the companies which are using Collaboration Software in Sweden.

For the companies which are using Collaboration Software in daily internal communication it is beneficial to understand the reasons of the higher level of communication performance which occurred in the respondent companies. As it was outlined in our study and literature review, companies will increase their communication performance if they employ different media for communication regarding the different communication processes in their internal communication through Collaboration Software.

7.3 Limitations and further research

Major limitation of this study was manifested in terms of usage of several different Collaboration Software inside the companies. There were some tools which were common in all of the interviewed companies, but on the other side there were tools which were present only in certain companies. The market for collaboration software is increasing constantly, and beside CISCO WebEx and Microsoft SharePoint and Lync, there are hundreds of others collaboration tools that are popular.

This limitation can have possible effects on the generalizability of the findings. Furthermore, we would like to stress the second limitation of this research which can be referred to the perception of communication performance in the interviewed companies. Researchers in this master thesis perceived the communication performance as satisfactory having in mind the general economic performance of the companies and the facts that they presented market leaders in their industries.

As a closing sentences of this thesis we would like to point out our overview of possible future research. We have seen in our research the new collaboration tools are emerging as it is the case with enterprise social networks. These tools together with the increased usage of Collaboration Software on mobile devices would represent possible areas for implementing the theoretical explanation of their communication performance with the lens of Media Synchronicity Theory.

8 Appendix

8.1 Appendix 1

Interview guide

Introduction

Confirm it is ok to record conversation and clarify that opportunity to review will be provided.

Introduction of interviewers and interviewees

Warm up question

Could you tell us a little about your company?

Main section

General questions

1. What software do you use for collaboration inside your company?
Insight, Jira, SharePoint, Lync, Skype,
2. How long do you use that software?
3. Do you have plans to make some changes in near future?
4. Do you look for solutions to integrate more software in one? Or do you develop your own collaboration platform?

Conveyance process questions

1. How do you inform your colleagues from the same office building, that physical meeting that will happen next week and they need to attend on it?

We can ask these sub questions on order to make it clear what we mean and what kind of answers we expect.

Do you send them a mail?

Writing the information on the info board in the office?

Writing a group instant message?

Sending them calendar invitation?

Going in every office and telling them physically?

You post on the enterprise social networking platform?

Do you inform every participant personally? Or you invite them through their managers?

Do you ask from them to confirm the attending? If yes, how they are confirming?

2. How do you inform colleagues from other city or country for the video meeting that will happen next week and they need to attend on it?
3. How do you share important company documentations of mutual interest for all employees of the company?
4. After internal meeting, do you share the minutes of the meeting to everyone that attend in the meeting? If yes, how do you do it?

Convergence process questions

1. When you are trying to finalize the content of a document or a letter, together with one or more colleagues, how do you do it?
2. When you have a technical issue that you need to fix with the help of a person from other department, how do you do it?
3. When you have ambiguity or misunderstanding issue when you cannot reach consensus with your colleagues, how you are debating with them? Do you use video conferencing? Face-to face, synchronous chatting or something else?

Mobile usage of collaboration software

We will finish our interview with several question about the perceived advantages for the usage of mobile collaboration software.

1. Do you use mobile versions of collaboration software? If yes, when? How often?
2. What kind of messages do you transmit through mobile?
3. Do you find it beneficial?

4. Do you communicate with your company when you are out of your office? Ex. Home, in a car, airport, train. If yes, how do you do it?
5. Do you have urgent video meetings on your phone/tablet if you are out of your office?
6. Do you make more mistakes in your writing and in the content of your messages when you are using your phone/tablet?

Closing questions

Is there anything else you want to point out regarding your usage of collaboration software for internal communication?

Debrief

Thank participant for their time and inform of timescales and method for provision of transcripts.

Issues to have in mind during interview.

We want to identify the reasons why they use the certain medium!!

Then we want to ask them WHY they usually made decisions about that particular media. Questions asked here arise from the media capabilities that every media has. This way we are collecting data about H4 to H7 which refer to media capabilities and their impact on synchronicity. We want to get data about the levels of synchronicity and their importance perceived by employees. Then compare it to the propositions in the theory. Here we expect to get data which will not fully support the theory.

Previously you said that you use e-mail for informing the colleagues for the meeting you are going to have next week.

Why did you choose the e-mail instead of video conferencing?

Was the time needed for the message to be received crucial?

Was the option to send the message to many recipients important for your decision?

Does the option to phrase the message properly and take your time to do it affect your decision?

Do you think that it is important for the recipients of your message to be able to reread your message once again before the meeting?

Do you managed to code your message properly via text on e-mail for this purpose?

Do you need any additional symbol sets like visual, verbal...?

8.2 Appendix 2

Transcript of interview at Seavus AB

Vasil Gocevski

Vice manager of sales

Summary of the answers

No.	Person	Question / Answer	Code
1	I.Z	What kind of tools do you use for internal communication?	
	V.G	<p><u>They are using:</u></p> <p>Microsoft exchange- for e-mails and calendar.</p> <p>Microsoft share point- Main repository for the documents.</p> <p>Mobile SharePoint they are not using, because they still didn't immigrate.</p> <p>Confluence [Atlassian software]- collaboration tool for discussions, planning, changing ideas and so on.</p> <p>Jira [Atlassian software]- ticket system for resolving technical issues.</p> <p>GoToMeeting- for video conference, and sharing conference.</p> <p>Mobile "GoToMeeting"</p>	

		<p>Microsoft Lync- video conferencing [sometimes]</p> <p>3CX central phone calling application- for international calls.</p> <p>Instant messenger: Skype</p> <p>Cisco WebEx- they used in past, they don't have license now.</p>	
2	I.Z	<p>How do you inform your colleagues from the same office building, that physical meeting that will happen next week and they need to attend on it?</p>	
	V.G	<p>For scheduling physical or online meeting they are using Microsoft exchange. The software is recommending terms where everyone is free to attend on a meeting, booking meeting rooms that are free in that term, and sending calendar invitations and emails to everyone that need participate in the meeting.</p> <p>Today everyone from the employees has a smartphone that has "Microsoft Exchange application on it", that makes the email as a medium more accessible compared to the time when the employees where limited to the desktop computers.</p>	CYSC
3	A.C	<p>After internal meeting, do you share the minutes of the meeting to everyone that attend in the meeting? If yes, how do you do it?</p>	

	V.G	<p>They are sending minuets on mail after every meeting. They don't record the meetings.</p> <p>Face-to-Face is their preferred way of meetings. Even as they are international company they tend to gather people from all over the world quite often together so that they can have more face to face communication. Alternatively they use Go-To-Meeting or Skype Video calls.</p>	CYEM
4	A.C	How do you discuss issues contacted with documents content?	
	V.G	They are using confluence and talking on Skype or "go to meeting".	CGSN CGVC
5	I.Z	When you are trying to work on the content of a document or a letter, together with one or more colleagues, how do you do it?	
	V.G	They are using SharePoint. This however generates problems sometimes as there is a limitation that only one person can work on one document. If the second person want to edit something while the document is edit by someone else they will not be able to do so. The solution is to either wait or save the version locally on person's computer and then to upload the changes once the first person is done editing	CYDS
6	I.Z	When you have a technical issue that you need to fix with the help of a person from other	

		department, how do you do it?	
	V.G	<p>They are using Jira. Everyone can submit report, starting with the summary of the problem and defining the urgency level.</p> <p>And the specific department is answering on the request for problem resolving.</p> <p>If they cannot fix the problem through Jira, then they are using phone or Skype.</p>	<p>CGIT</p> <p>CYAC CYVC</p>
7.		Do you use mobile versions of collaboration software for internal communication? If yes, when? How often and which applications?	
		<p>They are using it for writing e-mails and sometimes also video conferencing.</p> <p>If there is a need to write something with “track changes” they are avoiding mobile, but leaving to be write on laptop further on.</p> <p>From applications mostly they are using Microsoft exchange for e-mails and calendar, GoToMeeting and Skype.</p>	

8.3 Appendix 3

Interview 2
 Egmont Publishing,
<http://www.egmont.com>

Oskar Schultz
 Application Manager, Head of Business Applications

Line	Person	Question / Answer	Code
1	OS	I am the head of business applications, which means that all app we run, ERP solutions, BI, we have a lot of subscriptions systems and platform for e-commerce. All those tools are handled by my team. Teams are distributed in Malmo and Copenhagen.	
2	AC	What software for the internal communication inside the company do you use to collaborate with your team and with other employees inside the company?	
3	OS	We have bunch of them as we are a very large company with 2400 employees. We have tool called Insight which is some sort of CRM tool which distributes information about the company. Here we can see who is leaving, who is joining, and use basic results of economics or the budgets. There is also possibility for employees to create own profile, similar to Facebook where they have information about themselves. You are able to browse the network which is accessible by Egmont employees. So there are a lot of internal communication going on in this Insight tool that we use. It is based on Microsoft CRM. Otherwise we have collaboration tools like JIRA, which we use to control the projects and use to map up with documents etc. and also Microsoft SharePoint for accessing documents.	
4	IZ	SharePoint is your main repository?	
5	OS	Yes	
6	AC	Common case in the companies!!	
7	OS	We are publishing company, we have both Macintosh and pc for architects, but Microsoft is still the most common used.	
8	IZ	Do you have SharePoint mobile app?	

9	OS	I do believe we have. We do use quite a lot of mobile devices as we develop a lot of games and functionalities for smart devices. So every employee has a iPhone, or iPad, or smart devices, so yes, we have do a lot of functionality for mobile devices, I don't know if SharePoint is one of them, but I do believe that we have some functionality for do that.	
10	IZ	Except of e-mail, how do you communicate through mobile?	
11	OS	We use Microsoft Lync to communicate internally quite a lot and also Skype in those matters, where link is not present , so that is of course used by mobile devices in lots of case. There is a general strategy, we are sitting in an open environment, only CEO or CFO has their own office. Otherwise, we have a break up rooms, where we can go and take a mobile devices or computer and can do the conference call or what we need to do also. That's why we are focus on the open environment and then allow mobile devices to help us to achieve a good policy.	
12	IZ	Do you have video conference through mobiles also?	
13	OS	Both of them. We are really looking on where to go with the video conference. We are still using Cisco. We have dedicated rooms in each locations where we have Cisco devices, but more, we are looking at utilizing Lync for video conferences as well. We can use Lync to connect at several different places, either via connections in the room or via mobile devices.	
14	AC	In this part of the interview we are going to ask you what you use in specific situation. If you want to inform the employees for the physical meeting in the same building for next week and they need to confirm that meeting. How do you do that?	
15	OS	In that case we use calendar functions from Microsoft with Outlook, so that's further most common used.	CYSC
16	IZ	Are they received invitation on e-mail?	
17	OS	Yes, they receive invitation for events on email.	CYEM
18	AC	And they confirm their attendance?	
19	OS	Yes, they confirm their attendance through the calendar function.	CYSC

20	AC	So, you don't use any other tools?	
21	OS	Not at this stage. We are looking at possibility to use a shared calendars from JIRA, or some other tools, but it is little bit in a future, currently the Outlook and Exchange functions are good enough for us.	CYSC
22	AC	In situation when you have colleagues in Copenhagen as well and you want to have video meeting with them, which tools do you use for the video meeting, and how do you arrange the video meeting?	
23	OS	If it is internal meeting with my team, we usually use Skype or Lync. Previously I call them up by making a calendar request on Outlook (we have meeting there and there) and arrange the meeting. Then I call them through video conference.	CGVC CYSC
24	AC	If you want to share an important document, regarding to some projects or something and all of the team members have the common interest on that document, so how do you share the document, how do you make a document available for other to see and get informed about what's going on?	
25	OS	If it is outside my team, we use Microsoft SharePoint, if is in my team, we use JIRA.	CYDS
26	IZ	If you want to work on same document at the same time with some of your colleagues who are not in office with you, do you use some software with the functionality like google docs where you can follow what's happening all the time?	
27	OS	It is actually what we are looking for. JIRA gives such an option. Sky Drive is another tool that we looking to share documents and however it is not working well as we have seen it. So currently we are trying to implement web dove throughout organization.	CYDS CYDS
28	IZ	You need to press save to see the updates?	
29	OS	Versioning of documents is not a problem here. We need basically to share document and take them offline just like Dropbox, we don't need versioning. That's not so needed at this case. We have a lot of other app or systems that help us with editorial process. We have a large system to handle when a magazine is composed and there is PDF generated, that is taken care by quite an advanced system. So we don't share a large files in that sense. It is only a matter of	CYDS

		documents and excel sheets.	
30	AC	How do you report the technical stuff In the situation when you have issues with the equipment, or with the computer and you need some help from person from another department? Do you use a special software for that kind of cases or you just choose a Skype or instant messaging or e -mail?	
31	OS	Because we are large company, we of course need to have good support structure. There is a service desk function which is able to receive issues either by call or email. Case studies are logged and it is given a number and prioritizing for the issue. This is dealt by support staff within Egmont Publishing. Currently, my group is actually one of those entities and we use something called Jira service task which is also one of Jira packages and they are able to basically log a call or get emails from other systems. We need to prioritize the issues as we have a lot of business enabled systems and users that are highly prioritized where action needs to be taken immediately.	CGAC CGEM CGEM CGAC
32	IZ	Further on if there is a need for discussion in live, lets follow example with the technical person fixing some problem, are there a possibility for officially to communicate through Skype or is more often to take a phone call the technical staff?	
33	OS	More often, if the cases is logged, then we need more information and they usually call or give them an email and from the system itself so is both way communication, they don't use Skype or Lync for that type of communication, they usually use a regular phone.	CGAC CGEM CGAC
34	AC	How do you handle situation when you need to come to the shared understanding, ex. come to the conclusion from your group work, from a project, to finalize a project, to agree that everyone has its own tasks to finish up a project. Also in situation when there is a misunderstanding and you need to discuss it more, when something is not clear, For example it can be when the project is coming to deadline and you need to fix those issues, do you come together and have face to face meetings, or you have a video conference?	
35	OS	We have a lot of face to face communication. One part of my division is also handling the projects, so we have a project organization with the lot of project managers. They are keeping track of projects involving certain people from the organization and there we have a scheduled meeting. Let's say we have meeting on certain location, a face to face meeting, either in Copenhagen, in Stockholm, in Oslo etc. Before that, we can have a video conference by Lync or Skype and between that, there is of course smaller	CGFF CGVC

		projects, that needs to be taken care by a smaller group, but usually the tools that we use on that case of course is a mix of them. That a mix between face to face meeting and video conference or email conversation.	
	IZ	Do you have a rule for writing minutes after every meeting?	
36	OS	Both yes and no. Usually that is task of the project manager. Either minutes can be considered to be time consuming. It's better to write bullet points from meetings. There is no rule that we need to write minutes or bullet points.	
37	IZ	If someone is doing a summary of the meeting. Where do you put the document? Or you send it over e-mail?	
38	OS	Usually we put the summary documents in folder and then send out on Lync saying that it is an update in this folder. On the other side with SharePoint we are able to invite certain members to access this folder.	CYDS CYDS
39	AC	How you communicate out of office with your colleagues, what tools do you use mostly through your mobile devices? How do you communicate then?	
40	OS	If it is an emergency and I need to call one of my employees I try to call them on a phone. Otherwise I email them. We have a policy in my group stating that we should be accessible meaning that most of the staff are checking their emails regularly. It's also the benefits that we are giving smartphone for employees to use in order to be able to be accessed wherever they are. It is important to us for them to be available. But, usually we both call and e-mail.	CGAC CYEM
41	IZ	Do you avoid video conferences in the airports?	
42		No. But it is important to get into a quiet place where you can feel comfortable. It is not always easy at the airport to seat in a video conference with people while planes are flying around in the back, it can be distraction for the rest of them. In those situations it is more common to use only audio conferencing without video elements included.	CGAC
43	IZ	These were all the questions. These data will be used to explain your communication performance based on the theory. Thank you for the participation and the time you have devoted for us.	
44	OS	I am looking forward to see the final results. Maybe there will be something that we can use in our company.	

8.4 Appendix 4

Fair Enterprise Network Sweden AB

<http://www.fairenterprise.net>

Interview with Hemant Joshi, Office manager- Nepal

Line	Person	Question / Answer	Code
1	IZ	What is the main web address from your company? Is this what you have in your signature because we are trying to see, I know that Andreas send me be different, so what is your web page of your company?	
2	HJ	Our main partner is from Sweden, Andreas is working in Webservice Professional. That is our main partner, actually, Webservice is a company doing a business in Sweden, and we make our products here in Nepal and deliver to Webservice and then they deliver them to the final clients.	
3	IZ	Your company in Nepal is this Tulips Technologies?	
4	HJ	Yes in Nepal it is Tulips technology. Our main products are produced here and marketing is covered by Webservice. They are a software marketing company and we are software producers. We have close partnership. Main partner is Webservice and apart from that we have like two small clients in Denmark also. And in Africa we work for one university making MIS application. That University is based in Ruanda basically we got a contact on google, they want our product and we have a small partner in Ruanda now for different outsourcing business.	
5	IZ	Ok, ok, thank you for the introduction, we will introduce ourselves in two sentences...	
	AC	So we've done few interviews with big companies here in Sweden and this is great that we have a chance to have an interview with a company from Nepal that is communicating with companies from Denmark, Sweden and Ruanda. So we are really now interested about what kind of software do you use in communicating with the companies, are you using mobile collaboration software. Our main goal of this research is to test your internal communication so we want to know how you do really	

	IZ	<p>communicate inside the company with your colleges, and with people you work on projects? It's both the communication between the people there in your company which are suited in Nepal and also your communication with your partners here in Sweden and Denmark with which you work on product with them...</p> <p>and if sometimes when you are on the spot in Africa or in Sweden, how do you communicate with them? So, basically this are the things we are interested to know.</p>	
6	HJ	<p>Our communication is mainly being conducted by tool called Teamwork. You can go to teamwork.com and see how the software looks like. It is a project management software. This software is very easy to communicate for internal communication, also with project managers, developers, quality officer, we start with smaller pieces of task and we have deadlines, the software counts how many hours it takes you to finish the task. In every project there are tasks which are delegated to the staff. After that we can set a milestone and basically we can get overall communication with this software, so this is the main social communication between our developers and Webservice. We make a task and it is assign to some developers, and process can be followed. Once the task is done we check the task and once it is finished it is verified and now it is ready for Broxon. In broxon and we get a notification, ok this task is done and it updated Broxon environment so after that the communication that is ok pl.. is agreed with that task, ok this is it this is fine and you can close this up, and this task is closed.</p> <p>Every project we have a different milestone set. We have one milestone in this project, two milestones in another project. So the milestones are connected with the task so one task is completed, milestone is completed and we get a notification about that. And in this we have a different notifications like ok you have a milestone tomorrow, or like tomorrow we have a milestone delivery so everyone is prepared, or you get an e-mail notification, so mainly we use this software so our main more than 70 % of communication is through this software. For other communication normally we use Skype for simple communication. Our office is not very big, it is like two thousand square feet so we can just go to different department. Sometimes I have to call and make a meeting</p>	

		with developer. ... so we partially go to this office and discuss with the programmer so main communication is Teamwork, secondary, we use mostly Skype for instant messaging and up to that sometimes we gather up in a meeting room, sometimes we personally visit the developers. If you like to call Sweden office we use Skype and if there is a problem with Skype or the person is not available on Skype we use a phone to make the communication.	
7	IZ	You use regular Nepal phone or you use something else for calling?	
8	HJ	We use Nepali phone. In Nepal it is like 1 crown for minute, so it is very cheap.	
9	AC	Ok, and does the Teamwork software has the capability to share documents inside it, or you use something like SharePoint or Gira or Microsoft Lync to share the documents like to have a central repository for sharing the documentation with you work on. So how do you share it?	
10	HJ	Teamwork is basically simplified version of Gira, we have a lot of features but they are very easy to use. One client is actually using Gira and we had the experience to use it. It is more an advanced software if you compare the tools inside. But Teamwork is very easy and we like to use its very communicative like we have a list menu, and all the menus are very useful, we can upload the file, we can make a connection with Dropbox, google drive. We can totally use this software, suppose we make analysis, we make practical analysis and we make a main task analysis and several subtasks. let's say analyze something from the database, let's make a ER diagram, let's make like different other things so we make equally small tasks and we assign to each people so that people are responsible and once the task is completed it is closed and once it is closed also we can find the dedicated document within this task. so all the specification all the documentation all the images, all things can be updated in this software and we can link to Dropbox also, so it is connected to Dropbox also, so mainly we use Dropbox and Teamwork for like sharing files between Sweden and here. Also in our office we have internal time server which we use to share different documents so we have one copy In our office and in online	CYDS

		also we have normally all the documents also.	CYDS
11	AC	Ok, good. In cases when you need to schedule a meeting with your colleagues which are in the same building, how do you act in that situation? Do you use a software for calendar like Microsoft Exchange or you create an event there and you invite your colleagues, or you just send them regular e-mail or write them on instant message on a chat service. How do you arrange a meeting inside your building with your colleagues?	
12	HJ	We have two types of meeting, one is regular meeting that happens every week, Sundays 10pm, so other meetings are sometimes it is urgent meeting and it is unplanned. So for regular meetings we use Microsoft outlook meeting calendar and every time we have a meeting we get a notification and we go to the meeting room and make the meeting. So for regular meeting we use Microsoft outlook calendar and for other meetings normally like for tomorrow suddenly we need a meeting tomorrow at 2pm we communicate with Skype or mail. For like regular milestone meeting we use Teamwork, because when you set the milestone it automatically gives a notification. So we use Microsoft Exchange and Skype and Teamwork for this type of communication.	CYSC CYVC CYEM CYSN
13	AC	Ok, good. You said that you use mostly Dropbox to share the documents inside the company. So important documentation with which you work on the project and there are many people who are interested in accepting those documents, so you use Dropbox and google drive to make the documents available for many parties?	
14	HJ	That's right we use Dropbox. We use our file server also. So this document is big we use the file server, because with Dropbox will take a lot of time to link the file. We have a file server and that type server can be accessed from Sweden or any other place also, so we have our own server we can share between our office and like all the documents we share it on that server. So normally we use Dropbox and Teamwork and file server in this case.	CYDS
15	AC	Ok and when it happens to have a document with you are working on but you work with several other people like every person has its part of the document which needs to be	

		covered like making a report or something. Do you use any software for this purpose for collaboration inside the document like the google docs or something which enables you to access a single document by many people inside the company? Do you have situations like that?	
16	HJ	We used to use that google docs before, but right now we are not using google docs we Dropbox, for example I make the changes and I try to save. Another can open the file and he can write it on it. So, normally we are using Dropbox for this purpose.	CYDS
17	AC	Ok, the other thing we would like to know is also do you have some technical issues regarding the equipment that you use, a computer, projector or something and you need a help from some person which is technical support, how do you report that issue and how do you communicate with that staff in the company?	
18	HJ	For this type of communication we use Teamwork, in that system we can update will get assign the person from technical department. That person and you get a notification and you start working on that.	CGSN
19	AC	Ok, good. And when you need to communicate with your partner here in Sweden or in Denmark, I suppose you are using video conferencing for making meetings or you use audio conferences. Do you also come here to visit them to have a face meeting from time to time or it is only electronic communication with video or audio conferencing?	
20	HJ	The main communication is with Skype, we have a Skype group meeting, but only Skype meeting sometimes isn't enough and we go to Sweden and have a meeting there. But normally from Sweden the project manager comes to Nepal to discuss issues for important projects. So we normally have a communication in like 3 months. There will be like personal contacts like they will come to Nepal and have a meeting for different projects and then go back to Sweden. For the regular weekly meetings we use the Skype and sometimes we use phone also.	CGVC CGFF CGFF CGAC
21	IZ	Ok, good. We see that teamwork, has some native mobile applications, do you use them?	

22	HJ	Yeah, I use the mobile application they have a nice mobile app and when I am in office I don't use the app because I have my computer all the time. But when I am home or I am travelling I use the mobile app.	
23	IZ	Ok, you have some problems using the mobiles or everything is functioning well, do you write e-mails from the applications?	
24	HJ	I don't like e-mailing from mobile normally, I don't e-mail from mobile. I use it to read a mail from mobile when I am outside office but I don't like to mail from mobile. It is very hard to type, when it is long it is difficult to type and I prefer desktop pc instead of mobile.	
25	IZ	What about Skype conferencing for mobile, are you doing this sometimes when you are at the airport or in a rush?	
26	HJ	Yes when I'm on the airport we sometimes use WebEx for communication. But in Nepal the GPS is not as good as in Sweden so we actually use a phone instead of Skype in this case.	
27	IZ	Ok, we answered all the main questions that we were planning to ask you. If we will ... now we will have a measurement inside academic theory like how do you communicate in your company, if we have another questions I hope that we can post them through mail, ok? Thank you for your time and effort to conduct this interview.	
28	HJ	You are welcome. Bye Bye	

8.5 Appendix 5

Alfa Laval group Lund
 Jasmina Cilibrk
 Collaboration Manager at Alfa Laval

Karolina Tolvsgård
 Product Manager at Alfa Laval

<http://www.alfalaval.com>

Line	Person	Question / Answer	Code
1	IZ	On the beginning we would like to know what kind of collaboration tools you use.	
2	AL	We have our intranet, it's based on SharePoint 2010 and then we have collaboration environment, collaboration sites, we have 6 or 7 templates of web sites, templates when you need ad hoc collaboration, we do have templates collaboration project site, virtual collaboration sites.	
4	IZ	Do you use instant messaging as part of your share point system for communication?	
5	AL	We use Microsoft Lync as our instant messaging, we have it long time ago, two years ago, and it was actually spread like fire in the company, its very heavily used, people like it, sometimes we have some problems, technical problems can occur, problems with server, sometimes is not clear We use Lync for two purposes, first one what you just said instant messaging (two way communication) but it's equally heavily used for setting up meetings. We used to have external tool WebEx for managing our internal or external meetings. We also use very often Lync for conducting trainings or recording trainings and share those videos among employees. So I would say we use it for three purposes and now we are starting to use Lync as a first choice for audio conferencing, we are replacing the regular phone calls. Half year ago Lync is used on our mobile phone, so we are available everywhere. The quality of the connection bumps up and down. You can be on Lync on (available) and off (unavailable). For us that we are sitting in the landscape we put green when we available and red when we are not available. I can say link is gradually growing in our company. And there were not real training for the usage, people learned by using it.	CGIM CYIM CGVC CYDS CGAC
6	AL	One other side, we want to lower the trouble to people and need to travel for meetings.	

7	IZ	How many people can participate the most in a video conference for a meeting?	
8	AL	We have big groups attending this session, in the IS department we can be up to 100. In organization sense, there is one person controlling the mikes and giving word to people. It can be used for quite big scale. The biggest was I think 200 people. This is very big priority for us, because it stops people from travelling just for a meeting, and it is getting people together.	
9	IZ	From all this tools what do you have in your mobile except mail and calendar I guess?	
10	AL	I actually have from business perspective I have my Yammer but only I have it since I am from the IT department, because Yammer is not officially launched in our company. I also have Lync as well on my mobile. Which is a problem having link. You usually do this, you send the link via intranet, and then intranet is not available, and then link gets the blame of it or the phone or Share. So we try to make this somehow available on our mobile phone because there is a need. Some parts of the organization use apps for sales materials, but that's not for the whole organization. Some teams have the products in their phone, but we don't want to grow too much on this. What we talked about previously is most commonly used.	
11	IZ	It's common to use mobile for video conference?	
12	AL	No, than you have your PC. But on my way home in my car I prefer doing it, rather than skipping the meeting, its commuting in between. Every employee with white color (which is more than 80 % of the employees) has a mobile phone which is iPhone or android. You need to understand that this is in between. And then intranet is everywhere available we have more 16 000 employees but they also need a group account where they can log in.	CGVC
13	AC	Now we are going to ask you some really concrete question for situation where you need to collaborate. How do you approach this situation? You want to organize a meeting that will happen one week from now, and you want to invite your colleges from the other building. What communication do you use? And how do they approve the meeting? How do you this?	
14	AL	With calendar, and if you want to invite somebody we use the calendar invite and also Lync. But there is a firm rule that you need to go in the calendar and check the availability of people, and whether is this period occupied.	CYSC

15	AC	What about when you have meeting with people working in other countries, is it the same procedure?	
16	AL	Yes, it is very transparent, their calendars are also available.	CYSC
17	IZ	Do you sent minutes after every meeting?	
18	AL	Yes we try, not everybody, but we try. We summaries what we captured. We put the link on the collaboration site, where we put the minutes. The main thing with meeting minutes is that we put the link for the meeting minutes.	CYDS
19	IZ	What if you work few people on the same document at the same time?	
20	AL	It depends where the document is being stored from the very beginning. Product documents is stored somewhere else, brochure somewhere else. Me and my college we use the cooperating so we can work simultaneously.	
21	IZ	But you do this?	
22	AL	Yes we do, but I don't know whether all people have these skills, and I don't know whether people are commonly doing this. This function in this way: you make draft and then the other college can access the actual file and make changes, but I would say that majority of people still don't know this opportunity. I still receive a lot of emails with attach, check this version of the document what I have done. I am sorry to say this but yet this is the way that is still done a documents circulates via email and everybody checks what the others have done, there is still a lot of work to be done.	CYDS CYEM
23	AC	What about when you have situation when you have technical issue like projector or something and you need to report it to the department for technical support and they need to fix it. How do you inform them for this?	
24	AL	We do have ticket system, and we have first line support second line support or third line support. If you have problem with the computer than its first line support they come in person and check your computer, than if you have problem with the program than its second line support you share with a link or on a share desktop. Also we have number that you call and a person comes. When it comes projectors they are dealt with local service here.	CGIT CGAC
25	AC	How do you handle situation when you need to come to the shared understanding, ex. come to the conclusion from your group work, from a project, to finalize a project, to agree that everyone has its own tasks to finish up a	

		project. Also in situation when there is a misunderstanding and you need to discuss it more, when something is not clear. For example it can be when the project is coming to deadline and you need to fix those issues, do you come together and have face to face meetings, or you have a video conference, chatting?	
26	AL	Chatting is excluded. I would say email, collaboration site you have all the documents there. It depends where we are in the project. If it is a startup phase, or if it is crucial to have the consensus than it is important to have all the people in the same room, so everybody can get the sense and understanding, after that you can do it via video conference. As I said depends where you are in the project in which phase. In some stages it is better to have the people in the same room. This is an open company where everybody can have the say in it, so decisions take time.	CGFF CGVC
27	IZ	You said that you miss few things in the communication. Do you plan on implementing something new in the future?	
38	AL	For example if an employ wants to leave the company, with him we would also lose all the knowledge and information that he has. This employ would probably delete all his stuff, and that is I would say company knowledge. I see one new trend. I know that if you have something important to discuss or to share you share it via email, but now days these ad hoc question I have you discuss it via link so that is the trend more usage of link and less usage of the mail. But, where I can pose and find information, that would be in a data base knowledge of the company, as an access point when it comes to that. I see this as a gap that we don't have the proper tool to do that. And this has two aspects, I would say the first thing the link version that everybody uses today you can't save the history. The minute you close the window everything is lost. The link conversation from a meeting, you need to have it stored. You can keep the conversation as guideline, policy or whatever. But yet there is a difference. The other problem is the network of people where to get the proper answer. There are people that work here for quite some time and they know whom to address and get a feedback. What about the rest of us, that are not here for so long. So you pose certain question as an open question and you receive a reply from unknown people. This is also connected with the knowledge of the company. People when retire they take the knowledge with them.	CYSN
29	IZ	All these rules that you mentioned do you have them on paper, like strategy for internal communication for instance?	

30	AL	We have something, it is more like conducting not how to use certain toll, but for what purposes which tool to use like email or link HR has something like that Code of conduct	
31	AL	In the statistic document that I wanted to show you will see that younger people share information as the older people in the same way. Around 70 % of the information is private and shared via email, word of mouth sms. But you can see that word of mouth is second and email is the first tool for communication and the major.	
32	AC	Don't you have data for 2012?	
33	AL	No it was just before it's been launch, so there is no comparison to be made.	
34	IZ	Do you have practice when you agree something on word on mouth, to send an email after that to confirm it and have it on record?	
35	AL	Yes it is usually how it's been made. We try to educate people to track decision. But it is very difficult to do that.	
36	IZ	Thank you very much we covered everything, we will analyze this and send it to you. It was very useful, you helped us a lot.	
37	AL	Thank you	

8.6 Appendix 6

NVivo Print screen

The screenshot shows the NVivo software interface. On the left, there is a navigation pane with categories: SOURCES (Internals, Interviews, Externals, Memos), NODES (Nodes), CLASSIFICATIONS (Source Classifications, Node Classifications), COLLECTIONS, and QUERIES. The main area displays a table of nodes and a detailed view of the 'Dismissing Evidence' node.

Name	Sources	Refer...	Created On	Created By	Modified On	Modified By
Dismissing Evidence	4	8	5/23/14, 6:43 PM	AC	5/23/14, 7:16 PM	AC
Convergence Process...	4	6	5/23/14, 6:43 PM	AC	5/23/14, 7:46 PM	AC
Conveyance Process...	2	2	5/23/14, 6:45 PM	AC	5/23/14, 7:46 PM	AC
Supporting Evidence	4	53	5/23/14, 6:39 PM	AC	5/23/14, 7:34 PM	AC
Convergence Process...	4	23	5/23/14, 6:40 PM	AC	5/23/14, 7:47 PM	AC
Conveyance Process...	4	30	5/23/14, 6:39 PM	AC	5/23/14, 7:46 PM	AC

The detailed view for 'Dismissing Evidence' shows a 'Reference' tab with the following content:

Summary | **Reference**

[Internals\Interviews\Alfa Laval AB](#) - \$ 2 references coded [1.52% Coverage]

Reference 1 - 0.54% Coverage
but its equally heavily used for setting up meetings.

Reference 2 - 0.98% Coverage
We do have ticket system, and we have first line support second line support or third line support

[Internals\Interviews\Egmont](#) - \$ 3 references coded [0.47% Coverage]

Reference 1 - 0.09% Coverage
or email.

Reference 2 - 0.29% Coverage

Name	Sources	Refer...	Created On	Created By	Modified On	Modified By
Dismissing Evidence	4	8	5/23/14, 6:43 PM	AC	5/23/14, 7:16 PM	AC
Convergence Process...	4	6	5/23/14, 6:43 PM	AC	5/23/14, 7:46 PM	AC
CGDS	0	0	5/23/14, 7:16 PM	AC	5/23/14, 7:16 PM	AC
CGEM	1	3	5/23/14, 6:45 PM	AC	5/24/14, 12:47 PM	AC
CGIT	1	1	5/23/14, 8:30 PM	AC	5/24/14, 2:59 PM	AC
CGSC	0	0	5/23/14, 7:34 PM	AC	5/23/14, 8:31 PM	AC
CGSN	2	2	5/23/14, 7:59 PM	AC	5/24/14, 1:33 PM	AC
Conveyance Process...	2	2	5/23/14, 6:45 PM	AC	5/23/14, 7:46 PM	AC
CYAC	0	0	5/23/14, 8:39 PM	AC	5/23/14, 8:40 PM	AC
CYFF	0	0	5/23/14, 8:39 PM	AC	5/23/14, 8:40 PM	AC
CYIM	1	1	5/23/14, 7:15 PM	AC	5/24/14, 2:58 PM	AC
CYVC	1	1	5/23/14, 6:45 PM	AC	5/24/14, 1:30 PM	AC
Supporting Evidence	4	53	5/23/14, 6:39 PM	AC	5/23/14, 7:34 PM	AC
Convergence Process...	4	23	5/23/14, 6:40 PM	AC	5/23/14, 7:47 PM	AC
CGAC	4	10	5/23/14, 8:38 PM	AC	5/24/14, 2:59 PM	AC
CGFF	3	4	5/23/14, 8:39 PM	AC	5/24/14, 3:00 PM	AC
CGIM	1	1	5/23/14, 7:15 PM	AC	5/24/14, 2:11 PM	AC
CGVC	4	8	5/23/14, 6:44 PM	AC	5/24/14, 3:01 PM	AC
Conveyance Process...	4	30	5/23/14, 6:39 PM	AC	5/23/14, 7:46 PM	AC
CYDS	4	13	5/23/14, 7:14 PM	AC	5/24/14, 2:56 PM	AC
CYEM	4	6	5/23/14, 6:41 PM	AC	5/24/14, 2:56 PM	AC
CYIT	1	1	5/23/14, 8:30 PM	AC	5/23/14, 8:31 PM	AC
CYSC	4	8	5/23/14, 7:33 PM	AC	5/24/14, 2:52 PM	AC
CYSN	2	2	5/23/14, 7:59 PM	AC	5/24/14, 3:04 PM	AC

Name	Created On	Created By	Modified On	Modified By
Alfa Laval AB	5/23/14, 6:36 PM	AC	5/24/14, 3:05 PM	AC
Egmont	5/23/14, 6:26 PM	AC	5/24/14, 7:19 PM	IZ
Fair Enterprise Network...	5/23/14, 6:35 PM	AC	5/24/14, 1:40 PM	AC
Seavus	5/23/14, 6:26 PM	AC	5/23/14, 8:42 PM	AC

Egmont				Edit
			ok request , make a calendar request (i have meeting t here and there) we arrange the meeting and them I call them through video conference.	CYSC
24	AC		If you want to share an important document, regarding to some projects or something and all of the team members have the common interest on that document, so how do you share the document, how do you make a document available for other to see and get informed about what's going on?	
25	OS		If it is outside my team, we use microsoft share point, if is in my team, we use JIRA.	CYDS
26	IZ		If you want to work on same document at the same time with some of your colleagues who are not in office with you, do you use some software with the functionality like google docs where you can follow what's happening all the time?	
27	OS		It is actually what we are looking for. Jira gives such an option. Sky drive is another tool that we looking to share documents and however it is not working good as we have	CYDS

SOURCES > Internals > Interviews > Egmont

CGAC	
Summary	Reference
Internals\Interviews\Alfa Laval AB - § 2 references coded [0.86% Coverage]	
Reference 1 - 0.24% Coverage	
Lync for regular calls,	
Reference 2 - 0.62% Coverage	
Also we have number its 1717, that you call and a person comes.	
Internals\Interviews\Egmont - § 6 references coded [4.07% Coverage]	
Reference 1 - 0.43% Coverage	
Which is able to receive calls either if call	
Reference 2 - 1.57% Coverage	
my group is actually one of those entities and we use something call Jira service task which is also one of Jira packages and they are able to basically log a call	
Reference 3 - 0.18% Coverage	
they usually call	
Reference 4 - 0.33% Coverage	
they usually use a regular phone.	

9 References

- Ai, N., Lu, Y., & Deogun, J. S. (2008). The smart phones of tomorrow. *SIGBED Review*, 5(1), 16.
- Andriessen, E., & Vartiainen, M. (2006). *Emerging mobile virtual work*: Springer.
- Asimakopoulos, S., Boretos, G. P., & Mourlas, C. (2014). Forecasting "In the Pocket": Mobile Devices Can Improve Collaboration. *Foresight: The International Journal of Applied Forecasting*(32), 13-18.
- Bartelt, V. L., & Dennis, A. R. (2014). NATURE AND NURTURE: THE IMPACT OF AUTOMATICITY AND THE STRUCTURATION OF COMMUNICATION ON VIRTUAL TEAM BEHAVIOR AND PERFORMANCE. *MIS quarterly*, 38(2), 521-538.
- Berry, G. R. (2006). Can computer-mediated asynchronous communication improve team processes and decision making? Learning from the management literature. *Journal of Business Communication*, 43(4), 344-366.
- Bhattacharjee, A. (2012). *Social Science Research: principles, methods, and practices* (3 Ed.): University of South Florida.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology*, 13(1), 3-21.
- Creswell, J. W. (2007). *Qualitative inquiry & research design : choosing among five approaches / John W. Creswell*: Thousand Oaks : SAGE, cop. 2007 2. ed.
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management science*, 32(5), 554-571.
- Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987). Message equivocality, media selection, and manager performance: Implications for information systems. *MIS quarterly*, 11(3).
- Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation systems. *Academy of management review*, 9(2), 284-295.
- DeLuca, D., & Valacich, J. S. (2005). *Outcomes from conduct of virtual teams at two sites: Support for media synchronicity theory*. Paper presented at the System Sciences, 2005. HICSS'05. Proceedings of the 38th Annual Hawaii International Conference on.
- DeLuca, D., & Valacich, J. S. (2006). Virtual teams in and out of synchronicity. *Information Technology & People*, 19(4), 323-344.
- Dennis, A. R., Fuller, R. M., & Valacich, J. S. (2008). Media, tasks, and communication processes: A theory of media synchronicity. *MIS quarterly*, 32(3), 575-600.
- Dennis, A. R., & Kinney, S. T. (1998). Testing media richness theory in the new media: The effects of cues, feedback, and task equivocality. *Information Systems Research*, 9(3), 256-274.
- Dennis, A. R., & Valacich, J. S. (1999). *Rethinking media richness: Towards a theory of media synchronicity*. Paper presented at the Systems Sciences, 1999. HICSS-32. Proceedings of the 32nd Annual Hawaii International Conference on.
- Fuller, R. M., & Dennis, A. R. (2009). Does fit matter? The impact of task-technology fit and appropriation on team performance in repeated tasks. *Information Systems Research*, 20(1), 2-17.
- Giordano, G., & George, J. F. (2013). The Effects of Task Complexity and Group Member Experience on Computer-Mediated Groups Facing Deception. *IEEE Transactions on Professional Communication*, 56(3), 210-225. doi: 10.1109/TPC.2013.2273817
- Grinter, R. E., Herbsleb, J. D., & Perry, D. E. (1999). *The geography of coordination: dealing with distance in R&D work*. Paper presented at the Proceedings of the international ACM SIGGROUP conference on Supporting group work.

- Guerrero, L. A., Ochoa, S. F., Pino, J. A., & Collazos, C. A. (2006). Selecting computing devices to support mobile collaboration. *Group Decision and Negotiation*, 15(3), 243-271.
- Hamid Rafiq Khattak, S. Y., Rabia Basri. *COMMUNICATION SKILLS MODULE*.
- Hevner, A., & Chatterjee, S. (2010). *Design research in information systems: theory and practice* (Vol. 22): Springer.
- Hughes, J., & Bozionelos, N. (2007). Work-life balance as source of job dissatisfaction and withdrawal attitudes: An exploratory study on the views of male workers. *Personnel Review*, 36(1), 145-154.
- Hung, Y.-T., Duyen, N., Kong, W.-C., & Chua, A.-L. (2008). Reexamining media capacity theories using workplace instant messaging. *Professional Communication, IEEE Transactions on*, 51(4), 352-368.
- Kvale, S., & Brinkmann, S. (2009). *InterViews : learning the craft of qualitative research interviewing / Steinar Kvale, Svend Brinkmann*: Los Angeles : Sage Publications, cop. 2009 2. ed.
- McFarlane, F. W. (1984). *Information technology changes the way you compete*: Harvard Business Review, Reprint Service.
- Muhren, W. J., Van Den Eede, G., & Van de Walle, B. (2009). Making sense of media synchronicity in humanitarian crises. *Professional Communication, IEEE Transactions on*, 52(4), 377-397.
- Niinimäki, T., Piri, A., Lassenius, C., & Paasivaara, M. (2010). *Reflecting the choice and usage of communication tools in GSD projects with media synchronicity theory*. Paper presented at the Global Software Engineering (ICGSE), 2010 5th IEEE International Conference on.
- Norris, N. (1997). Error, bias and validity in qualitative research. *Educational Action Research*, 5(1), 172-176. doi: 10.1080/09650799700200020
- Randall, D. (2013). Ten Red Balloons: Virtual Teams and Online Communities.
- Randolph, J. J. (2009). A guide to writing the dissertation literature review. *Practical Assessment, Research & Evaluation*, 14(13), 2.
- Recker, J. (2013). *Scientific Research in Information Systems - A Beginner's Guide*: Springer Berlin Heidelberg.
- Ryoo, S., & Koo, C. (2010). The Moderating Effect of Media Synchronicity in the Communication Media Use and Knowledge Creation. *Asia Pacific Journal of Information Systems*, 20(2), 103-124.
- Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students [Elektronisk resurs] / Mark Saunders, Philip Lewis, Adrian Thornhill*: Harlow : Financial Times/Prentice Hall, cop. 2007 4. ed.
- Seale, C. (1999). Quality in qualitative research. *Qualitative inquiry*, 5(4), 465-478.
- Shah, N. (2014). More Americans working remotely. 16.04.2014, from <http://online.wsj.com/news/articles/SB10001424127887324539404578342503214110478>
- Shengnan, Y., Jinxing, H., Xiang, G., & Hongqin, X. (2012). *The effect of social media on tourism destination marketing: A media-synchronicity-theory based exploration*. Paper presented at the Service Systems and Service Management (ICSSSM), 2012 9th International Conference on.
- Silverman, D. (2013). *Doing qualitative research: A practical handbook*: SAGE Publications Limited.
- Yin, R. K. (2009). *Case study research: Design and methods* (Vol. 5): sage.
- Yu, B. (2011). Computer-Mediated Communication Systems. *TripleC (Cognition, Communication, Co-Operation): Open Access Journal for a Global Sustainable Information Society*, 9(2).