

Communication media choices in a knowledge-work organisation: A case study on the factors hindering efficient communication

Marketing
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Aalto University
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ABSTRACT

Motivation for the research and objectives

The study originated from the assumption, that the full advantages gained from ICT usage are yet to be achieved. It is critical to understand how efficient organisational communication and ICT impacts on the company's overall success and productivity: the first step is to understand the current state of media usage in knowledge-work. Thus, the study aimed to clearly establish the factors hindering efficient communication and media usage in organisation. The phenomenon was approached from the individual worker's perspective with the aid of two sub questions: what are the factors influencing on communication media choices in knowledge-work, and what is experienced as challenging in organisational communication.

The research strategy and methodology

This study adopted abductive case research strategy, which made it possible to examine the issue without separating it from its context. Research built on previous theories related to communication media usage and selection, as well as research on problems related to communication and knowledge-work. The case organisation was TeliaSonera: more specifically the unit Business Services Finland due to its special characteristics and requirements for seamless information flow in selling complex service solutions. Main empirical evidence was collected from 10 semi-structured interviews and supported with other evidence like intranet survey (sent to 220 employees, 113 responds) and documents in case organisation. Question and topic categories for the interviews were formed based on previous theories. In addition to case-specific material, a survey regarding media choices was sent to a large number of Finnish small and medium sized companies to establish the extent of the issues. This study formed a part of a broader research project examining the productivity and modern work.

Results

The results of this study indicate that employees choose communication media based on multiple different factors; it is rare, that the choice would be solely based on theoretical communication efficiency resulting from task-media fit. Challenges like information overload and interruptions are experienced in daily work. The aim was to clearly establish the factors hindering efficient communication in organisation; the factors found were classified into three categories: individual's attitudes, motives and background; organisational coordination and management; and finally situational factors. Examining and concentrating especially on the individual- and organisation-related factors could improve communication efficiency in organisation. However the individual employee has a very restricted chance to improve on inefficient communication alone, due to fact that the problem is primarily the one of the whole organisation. Thus organisation has a central role in influencing on communication culture, habits and skills of the workers, with the aid of training and clear instructions for media usage. When communication is efficient and media is used appropriately, it may in turn have the ability to improve decision quality of organisation.

Key Terms

Communication Medium, ICT, Information Overload, Organisational Communication, Knowledge Work, Communication Behaviour

TIIVISTELMÄ

Tutkimuksen tausta ja tavoitteet

Motivaatio tutkimukseen syntyi oletuksesta, että kaikkia tieto- ja viestintäteknologia-investointien potentiaalisia hyötyjä ei ole vielä saavutettu. On tärkeää ymmärtää, miten tietoteknologia ja yrityksen sisäinen viestintä vaikuttavat koko yrityksen tuottavuuteen ja suorituskykyyn. Aihetta lähestyttäessä ensimmäinen askel on selvittää, kuinka ja mitä viestintävälineitä tietotyössä käytetään tällä hetkellä. Tämä tutkimuksen tavoitteena oli määrittellä, mitkä tekijät estävät tehokasta viestintää ja viestintävälineiden käyttöä organisaatiossa. Ilmiötä lähestyttiin yksilön näkökulmasta seuraavien alakysymysten avulla: Mitkä tekijät vaikuttavat viestintävälineen valintaan tietotyössä? Mikä koetaan haastavaksi organisaation viestinnässä?

Toteutustapa, menetelmät ja aineistot

Tutkimus toteutettiin tapaustutkimuksena käyttäen abduktiivista lähestymistapaa, jolloin ilmiötä oli mahdollista tutkia erottamatta sitä kontekstistaan. Tutkimus pohjautuu aiempiin teorioihin viestintävälineen valinnasta ja tietotyön- sekä viestinnän haasteista. Tutkimus suoritettiin TeliaSonera Business Services Finland -yksikössä, jonka erikoispiirteet sopivat hyvin tutkimusongelmaan. Yksiköllä on korkea tarve tehokkaaseen tietovirtaan sillä se myy asiakkaille monimutkaisia palveluita joiden tuottamiseen tarvitaan saumatonta yhteistyötä työntekijöiden välillä. Empiirinen aineisto kerättiin puolistrukturoitujen haastattelujen muodossa, joita tehtiin kymmenen kappaletta. Noin tunnin kestäneet haastattelut suunniteltiin teoriapohjaan perustuen. Laadullista aineistoa tuettiin erilaisin dokumentein sekä kyselyin (lähetetty 220:lle, 113 vastausta). Jotta aiheen ja sen tärkeyden laajuus tunnistettaisiin, suoritettiin lisäksi kyselytutkimus lukuisissa suomalaisissa pk-yrityksissä. Tämä tutkimus oli osa laajempaa tutkimuskokonaisuutta, joka keskittyi tuottavuuteen ja tietotyöhön.

Tutkimuksen tulokset

Tulosten perusteella yksilöt valitsevat viestintävälineen moniin eri tekijöihin perustuen organisaation sisäisessä viestinnässä. Viestintävälinettä ei useinkaan valita pelkästään teoreettisen tehokkuuden tai tehtävään soveltuvuuden perusteella. Haasteet, kuten tietotulva ja jatkuvat keskeytykset, ovat jokapäiväisiä tietotyössä. Tutkimuksen tavoite oli selvittää tehokasta viestintää estävät tekijät. Löydetyt tekijät jaettiin kolmeen eri luokkaan; yksilön asenteet, motiivit ja tausta; organisaation koordinointiin sekä hallintoon liittyvät tekijät; sekä viimeisenä tilannetekijät. Jotta viestinnän tehokkuutta voitaisiin parantaa, tulisi ensisijaisesti keskittyä monitahoisiin yksilöön ja organisaatioon liittyviin tekijöihin. Tulosten perusteella yksittäisellä työntekijällä on hyvin pienet mahdollisuudet vaikuttaa viestinnän tehokkuuteen; ongelmat näyttävät esiintyvän organisaatiotasolla ja siellä ne tulisi myös korjata. Organisaatiolla on keskeinen vastuu yhteisten toimintatapojen kehittämisessä ja henkilöstön kouluttamisessa viestintävälineiden käyttöön liittyen, jotta viestintää voitaisiin tehostaa. Kun viestintävälineitä käytetään oikein, saattaa myös organisaation päätöksenteon laatu parantua.

Avainsanat

Viestintäväline, tieto- ja viestintäteknologia, tietotulva, organisaation viestintä, tietotyö, viestintäkäyttäytyminen

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1. Introduction

1.1. Background for the Research

During the recent years, knowledge-work organizations have faced a challenging paradox; even though technological development is rapid, and natural resources are used extensively, productivity has not always improved in an expected manner. Regardless of this declining trend, productivity growth in Finland is still high by international standards (Pohjola 2008). The explanation to the differences between the observed productivity trends is generally regarded to be information and communication technology (Jorgenson, Ho and Stiroh 2005, in Pohjola, 2008). New technology should accelerate productivity also through the re-organisation of production and new ways of operating, however, there has not yet been observations of statistically significant impacts if ICT (Pohjola, 2008).

The economy and work is more and more based on knowledge (Ojala & Pöysti 2008, 13) and growth is searched from the new ways of working and operating (Pohjola, 2008). There is thus a high need for more sustainable productivity and concentration on knowledge as a resource at macroeconomic level. The issue has not only been the interest of The Research Institute of the Finnish Economy, but also that of European Commission. On 6th of April 2005 the European Commission adopted a proposal for a new EU programme for Research. The proposal provides new impetus to increase Europe's growth and competitiveness, recognising that knowledge is Europe's greatest resource (MEMO/05/114, The EU's new Research Framework Programme 2007-2013).

At the microeconomic level, permanent competitive advantage of companies is based on the willingness of employees to achieve objects, strategy, mission and vision of organisation (Bottazzo, 2005). Cooperation and knowledge-building together seem to be the basis for productivity in knowledge work (Ojala & Pöysti 2008, 14). Bottazzo (2005) also notes that people will more and more devote their knowledge to organisations, and it is clear that in nowadays complex business environment management can't alone cope with quick

changes and problems without contribution of employees. Communication is the essence of organizations, and technology is part and parcel of that communication (Germonprez & Zigurs 2009).

Recent innovations in organizational forms, such as delayed management, empowered workers, telework, and ad hoc work groups, definitely have created the need to secure efficient information exchange and communication between dispersed workers and work groups (Straub & Karahanna, 1998, Ojala & Pöysti 2008, 16). Also, there is need for more environmental friendly work practices. The movement toward a less cohesive workplace suggests a need to deploy computer-based media, but it is not clear which media should be deployed and under what circumstances (Straub & Karahanna, 1998).

Usage of multiple, new communication media in complex work environments can have significant implications for productivity and efficiency of individuals and organisations (Watson-Manheim & Belanger, 2007). It has been shown that after controlling for industry and time effects as well as labour and other firm-level characteristics, the excess productivity of ICT-equipped labour ranges from eight to eighteen per cent (Maliranta & Rouvinen 2003). Overall, Maliranta and Rouvinen's (2003) report that concludes the first preliminary phase of "*The economic effects of information and communication technology*" research project, suggests that the ICT-induced excess productivity seems to be somewhat higher in services than in manufacturing. In Finland, ICT sector has even bigger influence on the economy, than in the other countries on average (Pohjola, 2008). Thus, ICT can be the key to success at micro- and macroeconomic level. However, it seems that the full potential and advantages has not been reached quite yet.

Possible explanations for the issues can arise from the ICT usage and management at microeconomic level. Provision of appropriate communication tools to support new organizational forms will continue to be a factor in organizational success (Straub & Karahanna, 1998). Given the advantages, organisations increasingly rely on communication technologies to support their business, and better connect teams with geographically distributed co-workers (Watson-Manheim & Belanger, 2007; Venkatesh & Speier, 2000), but unfortu-

nately often there is a serious lack of professional planning and management of the new media and tools. Managers often fail to think explicitly about strategies for electronic communication; instead, choices for electronic communication are often made by default and people use the lowest common denominator or most familiar tools, regardless of what they are trying to communicate (Germonprez & Zigurs 2009). Consequently, the challenge is how to manage the adoption of new tools and the overall communication as a coherent portfolio to enhance organisational communication performance.

According to Straub and Karahanna (1998), investigation of these important issues must begin with insights into why knowledge workers choose particular media for particular tasks in the first place. Even though the number of technologies available for employees constantly increases (Watson-Manheim & Belanger, 2007), increased use of different media is not only a positive thing; already in the year 2003 a large survey conducted by the Australian Psychological Society (APS 2003) found that 80 per cent of workers spent more than 20 per cent of their day dealing with emails. Users complain about feeling overwhelmed by the volume of messages they receive and they also seem to have difficulties to organize and manage their email data (Whittaker, 2005). According to Taylor et al. (2008), a common complaint of email users is its impact on their workload. New technological innovations provide opportunities for frequent interruptions, which may be detrimental to work productivity (Taylor et al. 2008). Continuous interruptions are especially common amongst knowledge- and service workers (Työ & Terveys 2006).

But it is not the email alone what increases the amount of difficulties. Nowadays people receive more and more information from different sources and channels, and it feels like the reasonable amount for processing has been passed a long time ago. As Rogers and Agarwala-Rogers (1975, in Jones, Ravid and Rafaeli 2004), describe information overload is defined as a stage of an individual or system, in which not all communication inputs can be processed and utilized. This leads to inevitable breakdown. People physically can't handle the amount of information anymore, which means reduced productivity. An interesting explanation for a direct link between coping and load is suggested in research demonstrat-

ing that often-repeated and well-learned actions may be engaged in a relatively automatic or mindless fashion (Langer, Blank and Chanowitz 1978 in Kirmeyer, 1988).

As described above, efficient knowledge flow between dispersed workers is extremely important for company's success. Electronic communication media is adopted to enhance communication, but it is not always problem free. In worst case, it might make employees life even harder and more stressful. Finally, it is critical to understand how efficient organisational communication and ICT impacts on the company's overall success and productivity.

1.2. Objectives of the study and research questions

This study aims to gain understanding in media usage of employees and establish the factors hindering efficient communication in the organisation. From the viewpoint of business studies and science, researchers have long studied the effects of social presence and media richness on media choice and the effects of media use.

Variety of scholars can provide valuable viewpoints in understanding the ICT usage and media choices in organisations. Social presence theory and media richness theory have been the most dominant theories used to explain the rational media choices (Robert & Dennis, 2005). Much research has been done regarding perceived media capabilities and communication performance as well as the social influence and situational factors (Kock 2004), but these approaches have not been efficiently combined (Webster & Trevino 1995; Kock 2004). Media richness, which long was the dominant theory, has been challenged because of conflicting results (Carlson & Zmud, 1999; Lee, 1994; Te'eni, 2001). As Dennis, Fuller and Valacich (2008) describe, explication of this complex issue would be beneficial not only to media research, but in research that considers the impact of media capabilities as they influence for example knowledge exchange in a variety of contexts. Thus, the ambition of this study to further develop these theories is not only advantageous for the field of media research, but also has a possibility to provide insights to the issues of productivity of ICT usage.

In the polarized media research field, multiple researchers have suggested that rational technology theories and social theories should complement each other (Webster and Trevino, 1995, Trevino et al. 2000; Kock, 2004). However, these studies usually focus on selection of one communication medium or on comparisons between two media. The focus on selection or use of a single communication medium limits understanding of current media usage in organisations, and may not capture the complexities of combining media (Watson-Manheim & Belanger, 2007). The results of prior research suggest that the capabilities and appropriateness of use of a communication medium are perceived differently under different circumstances; however, there are many questions still to be answered about how

different perceptions and usage patterns develop (Watson-Manheim and Belanger, 2007). The choice of media in previous studies is usually isolated from the ongoing work practices of users, which limits the understanding of the media usage in different situations (Watson-Manheim & Belanger, 2007). Consequently, there is a need to examine multiple media usage in organisation without separating the phenomenon from its context. In recent literature, Watson-Manheim and Belanger's (2007) study is one of the only ones representing the variety of media choices in this context.

The treatment of employees as a recourse is a starting point for considering the success of the company and internal communication (Bottazzo, 2005), thus it is important to understand how individual employees experience organisational communication. The research to date has not paid sufficient attention to increasing the understanding on the cognitive processes of communication (Robert & Dennis, 2005). Cognitive Model of Media Choice (Robert & Dennis, 2005) presents a richness paradox in media capabilities in terms of individual's ability to process information versus motivation to engage into communication

There is a need for combining the recent theories efficiently, in the right context. Thus, when rational media choice theory like Media Synchronicity (Dennis et al. 2008) is complemented with theories, which take contextual factors into consideration, more understanding of media usage, selections and consequences can be gained. By adopting the cognitive model of media choice as a part of a theoretical model gives more insights to efficiency and problems of communication. This study aims to increase the understanding of the possible barriers hindering efficient communication within a knowledge-work organization. The following research question is posed to be answered by the study:

“What are the factors hindering efficient communication in knowledge-work organization?”

Previous literature has not explained the factors hindering efficient media usage in organisational communication or the interrelations between the choice factors and challenges. Thus, the main research question is to be answered with the aid of the theories related to the sub questions. Hence, the present study sheds light on how do individuals select the

communication media to accomplish their work. Following sub-questions help understanding the issue:

- *What are the factors influencing on individuals' media choices in knowledge-work?*
- *What is experienced as challenging in organisational communication?*

The main focus of the present study is laid on individual employees: How do the individuals in professional organisations perceive the challenges related to communication? It is important to discover whether the challenges exist in organisation to be able to understand the factors hindering efficient communication. These issues are explored in knowledge-work context through a single case company TeliaSonera, a major player in the Nordic telecommunication field. Interest in the issue is the one of the management of Business Services Finland unit of TeliaSonera. Business Services unit provides a fertile context for exploring the issues due to its characteristics; unit has a high need for co-operation and communication between workers due to complex services sold to customers.

This study adopts abductive case research strategy, which makes it possible to consider the issue without separating it from its context. Case material is supported with other evidence to establish the extent of the problems in Finnish organisations in general. This study forms a part of a broader research project examining the productivity and modern work¹. Ongoing communication practices in organisation and the changes in work habits made possible by new communication media tools, are the interest of the project. In addition to this thesis, theses conducted by two other researchers² complement the research project and provide insights to phenomenon from the perspectives of task technology fit, organisation processes, and usability as well as adoption of new technology.

¹ Uuskasvua ymmärtämässä – kutsu kestäväään tuottavuuteen. Grönroos/ Sonera, 2010

² Simo Hakkarainen, Aalto University School of Technology, 2011
Kimmo Pekkanen, Aalto University School of Economics, 2011

1.3. The Contents of the Study and Definitions of Key Terms

To start with, literature review is presented in the second chapter. Theories related to communication media choices and challenges are presented, and theories chosen for this study discussed more in detail. In the end of the second chapter, conceptual framework is presented.

In the third chapter methodological choices and approaches of this study are discussed. In the fourth chapter, the case organisation is described. Empirical findings are presented in the chapter five. In the last chapter, revised framework and discussion, limitations as well as future research directions and conclusions are discussed.

The definitions of key terms and concepts of the study are defined as follows:

Communication Media: Oxford English Dictionary defines medium as "a means or channel of communication or expression". Thus, in this study communication media refers to all the tools and channels from technical solutions to face-to-face meetings. Media used for internal communication in organisation is in focus.

ICT: The definition for IT is as follows: "The branch of technology concerned with the dissemination, processing, and storage of information, esp. by means of computers" (Oxford English Dictionary). In this study, the term ICT is used instead, which means information and communication technology, thus referring especially IT solutions related to communication.

Communication Behaviour: In this study, the term refers to Individuals choices, behaviour patterns and actions related to organisational communication between colleagues .

Organisational Communication: Communication conducted within organisations by employees for work-related issues, influences on efficient flow of knowledge and information.

Information Overload: Oxford English Dictionary defines the term as “exposure to or provision of too much information; a problematic situation or state of mental stress arising from this”. Thus, information overload means the point where individual’s ability to process information is low due to too large amount of information. Rogers and Agarwala-Rogers (1975, in Jones, Ravid and Rafaeli 2004), describe information overload as a stage of an individual or system, in which not all communication inputs can be processed and utilized.

Knowledge Work: Oxford English Dictionary defines the term as follows: “work which involves handling or using information”. In this study, high usage of information technology is strongly related to this term. Using, sharing, processing and creating knowledge is essential.

Media Synchronicity: Theory defining the performance of communication, aiming to match the communication process with appropriate media capabilities, referring to rational media usage (Dennis, Fuller & Valacich 2008).

Cognitive Model of Media Choice: Theory based on elaboration likelihood, assumes that different media provide different possibilities for individual to process information efficiently. (Robert & Dennis 2005)

Communication Media Repertoires: Watson-Manheim and Belanger (2007) define the term as the collection of communication channels and identifiable routines of use for specific communication purposes within a community. This in other words refers to the media available and used in organisation. In this study, the communication media repertoires is used for referring the theory (Watson-Manheim & Belanger 2007) where the choice is based on media available as well as structuring conditions like institutional and situational factors.

2. Literature Review

In this chapter, previous literature is studied first related to communication media choices, usage and efficiency. These theories are needed when trying to answer the sub question of the study; *“What are the factors influencing on individuals’ media choices in knowledge-work”*. First chapter includes the review of recent media research, after which the relevant theories selected for this study are presented. The second part of the chapter is related to the sub question *“What is experienced as challenging in organisational communication”*. In this part, challenges in knowledge intensive work related to communication as well as the theoretical background for the origins and consequences of the challenges are discussed.

2.1. Communication Media Choices and Usage

In this study, *communication media* is defined as a channel, tool or device, which is used to conduct a communicative act, including technological solutions and personal meetings. In the first part of this chapter, previous research in the field of communication media usage is presented and critically evaluated. Theories explaining how and when communication media is used can be mainly classified as media trait theories and social influence theories (Carlson & Davis 1998).

In the second and third part, theories chosen for this study are discussed. Media Synchronicity (Dennis et al. 2008) is chosen to explain the rational side of individual’s media choices; the essence of the theory is communication performance. Communication Media Repertoires (Watson-Manheim & Belanger 2007) is the second theory to be applied in addition to MST to better understand the complexity of the media choices; many other factors than expected communication performance influence on individual’s media choice. This theory deals with structuring condition like situation, and organisational norms in relation to media choices. To understand why both of these theories are used and partly combined, it is important first to understand the different theoretical polarization of communication media research.

2.1.1. Review of Communication Media Research

The field of communication media research is highly polarized. Multiple researchers have paid attention to these media trait- and social influence theories publishing excellent and critical reviews during the past years (Carlson & Zmud, 1999; Kock, 2004; Te'eni 2001). In addition, structurational models (Yates and Orlikowski, 1992) have been noted as useful and popular theories.

Media trait theories assume that different technologies have relatively static and objective characteristics. The choice of communication media is assumed to be rational; users match the stable characteristics of a medium to a specific task or communication objective. However, findings from these theories have been inconsistent (Carlson & Zmud, 1999; Lee, 1994; Te'eni, 2001). Still, Media Richness Theory (Daft & Lengel, 1986) can be considered as one of the most known media trait theory.

Daft and Lengel (1986) propose that there are two forces, which influence on organisation's information processing; uncertainty and equivocality. Communication media vary in terms of capacity to process rich information; face-to-face is the medium providing most possibilities for rich information processing, after that telephone, personal documents, and the least rich medium is unaddressed written documents (Daft et al. 1987, Daft & Lengel 1986). The richness of each medium is based upon four criteria: feedback, multiple cues, language variety and personal focus (Daft et al. 1987, Daft & Lengel 1986) Study by Daft et al. (1987) was conducted to explain managers' selection of communication media. Thus, MRT is not a media or communication performance, but media choice theory related to managers preferred choices.

Managers seem to prefer rich media for ambiguous communications and less rich media for unequivocal communications (Daft et al. 1987). Also, according to MRT, highly rated managers seem to displayed sensitivity to the different media requirements (Daft et al. 1987), which indicates the importance of media selections in business. Even though MRT can't necessarily be applied into new media, it still provides important insights to media selection, preferences and managerial performance, as well as media capabilities.

However, Watson-Manheim and Belanger (2007) claim that there are some studies indicating the features of media are more dynamic than assumed in trait theories. For example, the same medium can be considered rich or lean depending on situational factors like norms and rules for interaction within a particular work environment (Fulk 1993) or contextual factors (Carlson and Zmud 1999; Carlson and Davis 1998; Lee 1994).

According to Markus (1994), media richness theory has been challenged for failure to take into account situational factors that might influence behaviour, and social factors that might shape perceptions of media. As a result, the theory has been revised and elaborated in various ways (Markus 1994). For example, Trevino et al. (1987) extended media richness theory beyond its original core concerns with information processing requirements to include two other media selection criteria: situational constraints (e.g., time and place) and symbolic considerations (e.g., desire to convey authority).

The task-technology fit (TTF) framework was suggested by Goodhue and Thompson (1995). It proposes matching ICT characteristics with task characteristics, has been applied to communication in order to prescribe effective use of communication media (Hung et al. 2008). Communication theories based on the TTF framework, including media capacity theories, have provided great insights into media selection, ICT adoption and use, and ICT-mediated communications (Hung et al. 2008).

To broaden the narrow viewpoint of MRT, Carlson and Zmud (1999) have presented channel expansion theory as an extension of media trait theories. Theory suggests that an individual's experience with media, topic, and a communication partner influences perceived richness of a medium. They also note that perceptions about the media change over time. (Carlson and Zmud, 1999)

According to Watson-Manheim and Belanger (2007), different to media trait theories, *Social influence theories* are stressing the role of a social actor in media usage. One of the major contributions of the social influence model to communication technology usage literature is emphasizing the importance of social influences, such as organizational norms, have on how

communication technologies in usage (Stephens & Davis 2009; Fulk & Boyd 1991). The influence of organizational norms on communications media use has been demonstrated in a variety of studies (Fulk, 1993; Markus, 1994; Watson-Manheim & Belanger, 2007; Yates & Orlikowski, 1992).

Media trait theories and Social influence theories presented are based on very different backgrounds and views. As Hung et al. (2008) claim, that theoretical revisions are needed to improve the explanation power of media capacity theories. It is challenging to define media capacity based on objective media characteristics, and recent theoretical development that incorporates temporal and social factors seems to be moving in the right direction (Hung et al. 2008).

Theoretical polarization regarding media choices has led to some problems (Kock, 2004). Kock (2004) criticizes general labels given for media theories to be misleading; one of these labels is that of “rational choice” theories (Markus 1994, Webster and Trevino 1995). According to Kock (2004), this misleading label is arguably generic enough to include any theory that emphasizes the role of rational responses to technology in determining communication media choice behaviour, and that places little emphasis on the role of social influences (Kock 2004).

As Kock (2004) explains, it is problematic that social theorists often reject the theories labeled as “rational choice theories” even though these theories seem to explain communication media perceptions and choice in limited, specific circumstances (Daft et al. 1987, Straub and Karahanna 1998). Timmerman (2002) notes that media selection research often fails to conceptualize media use as an activity that occurs within larger, ongoing communication process. However, it might be possible to overcome this problem. Thus, rational choice theories seem to have some explanation power. That is why there is justification for attempts to expand and refine them (Carlson and Zmud 1999) as well as to combine them with social theories (Trevino et al. 2000).

The second reason what rejecting rational theories is problematic, is that the 1990s have seen the development of theories stressing the influence of technology features on media choice behaviour that have little to do with the social presence and media richness theories (Kock, 2004). Example of these theories is the task-technology fit theory (Goodhue and Thompson 1995). Thus said, none of the theories should be rejected, instead, more unified view is needed. Classifications may restrict the examination of the phenomenon in the wider scale and context.

Previously described problems prove, that none of the communication media theories can alone explain the media choices completely. Much research has been done regarding perceived media capabilities and communication performance as well as about social influence and situational factors (Kock 2004), but these approaches have not been efficiently combined (Webster & Trevino 1995; Kock 2004). Multiple researchers have suggested that rational technology theories and social theories complement each other (Webster and Trevino, 1995, Trevino et al. 2000; Kock, 2004).

Even though being criticized, traditional media theories are included to this study in some degree; *Media Synchronicity theory's* (Dennis et al 2008) background is on media trait theories, though MST provides changes and improvements for increased reliability and explanation power. Media synchronicity theory builds on many of the ideas proposed in other models; the medium-centric perspective of Media richness theory (Daft & Lengel, 1986) and Channel Expansion Theory (Carlson and Zmud 1999), as well as the contextual aspects of the cognitive model of media (Robert & Dennis, 2005). Relevant parts of Media Synchronicity Theory (Dennis et al 2008) are used as “rational media choice/performance theory” in this study. Keeping the previously presented critique towards rational theory –labels, it must be said here that the term” rational” is only used for describing the theoretical efficiency of the media usage.

Another active area of research related to communication media choices has been on *the influence of contextual factors* (Watson-Manheim & Belanger, 2007) which have been found to significantly influence the decision to use a communication medium (or example, urgency

of the communication event influences the choice of medium (Trevino et al. 1987). (Watson-Manheim & Belanger, 2007) In this study, contextual factors are included by examining Communication Media Repertoires theory (Watson-Manheim & Belanger, 2007).

According to Orlikowski (2000), the past decade has also seen the development of a number of *structural models* of technology, which have generated numerous insights into the role and influence of technologies in organizations (DeSanctis and Poole 1994). Business professionals and researchers are often disappointed with the fact that advances in computing technology have not brought about remarkable improvements in organizational effectiveness (Orlikowski 2000). Structuration models are appealing because they emphasize the interplay between technology and the social process of technology use, demonstrating how multiple outcomes can result from adoption of the same technology (Orlikowski 2000).

Orlikowski and Yates (1992) investigate communicative practices through the analytic lens of the "communicative genres" enacted within a community. They have previously defined genres of organizational communication as socially recognized types of communicative actions—such as memos, meetings, expense forms, training seminars—that are habitually enacted by members of a community to realize particular social purposes (Yates and Orlikowski, 1992). Communication Media Repertoires (Watson-Manheim & Belanger, 2007) builds on Orlikowski's work, and defines the perceived media options available for employees in this study. Given the fact that media selection may occur under conditions of objective reality, but it also can be subject to less objective social influences (Saunders & Jones 1990), communication media repertoires (Watson-Manheim & Belanger 2007) brings along theoretical perspective of organisational norms and practices in this study.

It needs to be noted, that even though communication media is perceived to have certain capabilities, there is a recognized paradox between information processing ability and motivation, when choosing the efficient media. Rational or social theories alone are necessarily not able to describe all the factors influencing the media choices and communication performance. Information overload poses a significant problem for communication in professional organisations, and it is unclear in which degree individuals rationally choose the me-

dia. Timmerman (2002) has suggested that traditional media capability theories, like Media Richness, explain only around 35% of media choices. To cope with the overload, employees have to prioritize work tasks and apply simple heuristics to communication. There is simply not enough time to deeply concentrate on every single message received. Thus, it has to be remembered, that the explanation power of the theories is incomplete without including the expectation of mindfulness of decision-making process.

As noted previously, many studies have found mixed or conflicting results when testing rational Media Richness theory empirically (Carlson & Zmud, 1999; Lee, 1994; Te'eni, 2001). Also, according to Timmerman (2002), when collapsing across the mindlessness/mindful conditions e.g. choice is not actively processed in individuals mind, Media Richness, a commonly used theory in the field of communication behaviour research, explanations accurately predicted only 37% of the participants' media use. Hrastinski (2008) mentions Cognitive model of media choice to be one of the theories explaining conflicting results. Cognitive model of media choice can provide insights in understanding the consequences of communication media choices, for example the different levels of processing ability and decision quality occurring and the paradox between them. In this study, cognitive model of media choice is going to be considered when discussing the challenges related to communication.

To summarize; Media Synchronicity Theory (Dennis et al. 2008) is to be applied as a main theory in this study and completed with Media Repertoires (Watson-Manheim & Belanger, 2007). MST considers different media to have different capabilities, which influence on efficiency of media choice in different situations. These capabilities are considered to be matched to communication process type; conveyance or convergence, which leads into task-media fit and efficient communication performance. In this study, communication Media Repertoires –theory complements MST in terms of situational and institutional factors. It also enables the approach in which the media perceived available is considered as a factor influencing on communication behaviour and choices. Often researchers have been examining only one or two media used in organisations. By adopting Media Repertoires this narrow viewpoint can be overcome.

2.1.2. Media Synchronicity Theory

Media Synchronicity Theory (MST) is used in this case study provide insights to efficient usage of communication media assuming that media is chosen rationally based on capabilities and message purpose. Thus, it presents one factor influencing on individual's media choice. As Dennis et al. (2008) explain, on the contrary to most of the prior theories, Media Synchronicity Theory (MST) is a theory of communication performance, not media choice. It does not address the factors influencing how people choose different media, although the desire to achieve shared understanding is likely to be a factor influencing on choice.

In the beginning of the chapter, communication processes and synchronicity are presented, followed by media capabilities. MST is provided by Dennis et al. (2008), and is extension of the previous MST presented by Dennis and Valacich (1999). Media Synchronicity is defined as the extent to which the capabilities of communication medium enable individuals to achieve synchronicity. Fit of media capabilities to the communication needs of the task influence the use of media (see figure 1), which in turn influence communication performance (Dennis et al. 2008).

MST recognizes the effect of appropriation factors on communication performance (see figure 1), and thus does not claim the efficiency resulting totally based on media capability-communication process match. These appropriation factors are presented in the end of this chapter.

MST (Dennis et al 2008) builds on media trait theories, though providing changes and improvements for increased reliability and explanation power. As described in the previous chapter, MST successfully combines the relevant parts of theories like Media richness theory (Daft & Lengel, 1986) and the contextual aspects of the cognitive model of media choice (Robert & Dennis, 2005) amongst others.

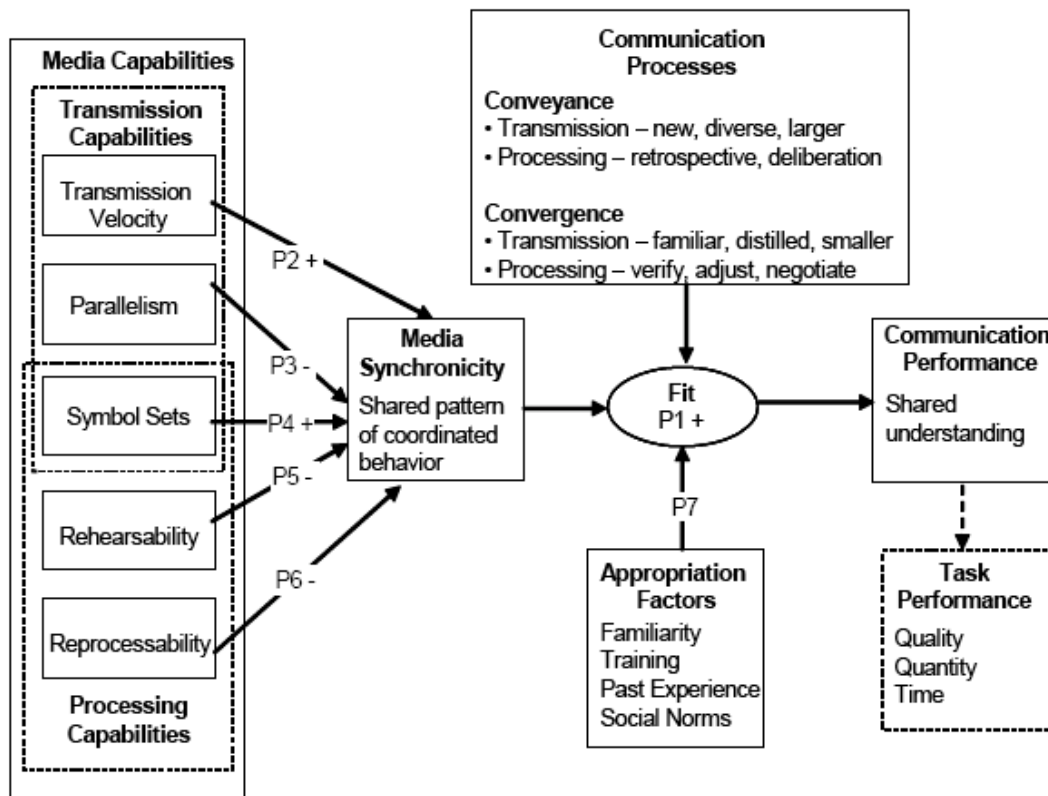


Figure 1. Media Synchronicity Theory (Dennis et al. 2008)

2.1.2.1. Convergence and conveyance in relation to synchronicity

In Media synchronicity theory (MST), communication is argued to be composed of two primary processes; conveyance of information and convergence of meaning. In order to perform conveyance or convergence, individual must engage in two individual processes; information transmission and processing (Dennis et al. 2008).

MST proposes that for conveyance processes, use of media supporting lower synchronicity should result in better communication performance. For convergence processes, use of media supporting higher synchronicity should result in better communication performance (Dennis et al. 2008). One of the theories used when MST was formed is Cognitive model of

media choice, which explains how media based on their levels of social presence, either support or hinder motivation and the ability to process (Robert & Dennis, 2005).

Dennis et al. (2008) state, that because the goal is to understand other's interpretations of information, the ability of the medium to provide synchronicity is extremely important in convergence communication. Usage of media low in synchronicity can negatively impact convergence processes by increasing delays that impede the rapid development of shared understanding (Dennis et al. 2008). As a result, it can be said that synchronous media should be used for convergence communication to ensure the high performance (see table 1).

In conveyance communication, which is typically transmitting information and enabling the analysis typical of conveyance, individuals do not need to work together or at the same time (Dennis et al. 2008). If the message is complex, individuals will require more time to assess and deliberate on the information (Dennis et al. 2008). Media that support higher levels of synchronicity can generate expectations of rapid interaction, which can interfere with deliberation processes (Dennis et al. 2008). Using media with higher synchronicity for conveyance processes may impair development of understanding because individuals will not have the time required to fully process the information (Robert and Dennis 2005). This may cause a greater cognitive load on the individual (Te'eni 2001). Thus, asynchronous media is better suitable for conveyance communication as can be seen from table 1.

As is to be described in the next chapter, Dennis et al. (2008) identify five capabilities of media (symbol sets, parallelism, transmission velocity, rehearsability, and reprocessability) that influence the development of synchronicity and thus the successful performance of conveyance and convergence communication processes.

The successful completion of most tasks involving more than one individual requires both conveyance and convergence processes, thus communication performance will be improved when individuals use a variety of media to perform a task, rather than just one medium (Dennis et al. 2008; Robert & Dennis 2005; Dennis & Valacich 1999). When the familiarity of

the task, individuals and communication media increases, the need for media supporting high synchronicity is reduced (Dennis et al. 2008).

Communication Process	Information Transmission Characteristics	Information Processing Characteristics	Media Synchronicity Required
Conveyance	Higher Quality Various Formats Multiple Sources	Retrospective Slower	Lower
Conveyance	Lower Quality Specific Format Specific Sources Faster	Verification Adjustment Negotiation Faster	Higher

Table 1. Communication process characteristics and synchronicity required (Dennis et al. 2008)

2.1.2.2. Media Capabilities

Different media have different capabilities, which have influence on the degree of synchronicity of the media. Dennis et al. (2009) have defined a specified list of qualifications and features of different communication medium in terms of transmission and processing capabilities, which are going to be examined next. These features are somewhat based on medium-centric perspectives of Media richness theory (Daft & Lengel, 1986). Each feature either adds or reduces synchronicity provided by medium (Dennis et al. 2008).

Shannon and Weaver’s (1949) theory is a base for the capability classification by Dennis et al. (2008) Dennis et al. (2008) argue, that three primary media capabilities are important in deriving a medium’s ability to support information transmission: transmission velocity (channel capacity), parallelism (number of frequencies), and symbol sets (symbol types). Two media capabilities build on Shannon and Weaver’s encoding and decoding processes and are important for information processing: rehearsability (encoding) and reprocessability (decoding). Table 2 introduces the characteristics of symbol sets more in detail.

Transmission Velocity	Parallelism	Symbol Sets	Rehearsability	Reprocessability
Rapidity of feedback Interactivity	Number of simultaneous transmissions	Ways of encoding, Multiplicity of cues: language variety, physical, verbal, visual cues (similar to media richness)	Possibility to rehearse or fine tune message before sending	Possibility to re-examine message
Enables shared focus	Enhances multidirectional communication Lowers shared focus	Natural symbol sets (visual, verbal, physical) facilitate precise encoding and decision making Written text faster to decode	Facilitates precise encoding and decoding, Can create delays Lowers shared focus	Important in new/large amount of information important in conveyance processes Can create delays. Lowers shared focus
Increases synchronicity	Reduces synchronicity	Natural symbol sets increase synchronicity	Reduces synchronicity	Reduces synchronicity

Table 2. Characteristics of symbol sets. Adjusted from Dennis et al. 2008

The inability to transmit certain symbols sets (e.g., physical, visual, and verbal symbols) may have some effect on the development of social perceptions (Daft and Lengel 1986) Although Daft and Lengel (1986) defined personalness (and social presence) as a characteristic of media, Dennis et al. (2008) portray these as socially derived outcomes of communication processes that may be moderated by the media's capability to deliver certain cues in a certain way.

In table 3, Dennis et al. (2008) present several commonly used media on these five capabilities, and the resulting impact on information transmission, information processing, and synchronicity. Table does not suggest that individuals must use certain media in certain ways; it just presents conclusions about the resulting capabilities when media are used in these ways (Dennis et al. 2008). It is important to notice, that not any single medium has the best values for both information transmission and information processing, so no single medium could be labelled as most appropriate for a task (Dennis et al. 2008).

Table 3 also reinforces the conclusions that there is an inherent paradox between information transmission and information processing (Robert and Dennis 2005), which is going to be

described more in deep in the next chapter. Media that have strong capabilities to support information transmission typically lack strong capabilities to support information processing (Robert and Dennis 2005). Of course, theory does not include new media like social networking tools even though it takes instant messaging into consideration. Thus, in theory, new media might have possibilities to overcome the paradox.

	Transmission Velocity	Parallelism	Symbol Sets	Rehearsability	Reprocessability	Information Transmission	Information Processing	Synchronicity
F2F	High	Medium	Few-Many	Low	Low	Fast	Low	High
Video Conference	High	Medium	Few-Many	Low	Low	Fast	Low	High
Tele Conference	High	Low	Few	Low	Low	Fast	Low	Medium
Instant Messaging	Medium-High	Low-Medium	Few-Medium	Medium	Medium-High	Medium	Low-Medium	Medium
Web Conference	Medium	High	Few-Medium	Medium-High	High	Medium-Slow	Medium-High	Low-Medium
Email	Low-Medium	High	Few-Medium	High	High	Slow	High	Low
Fax	Low-Medium	Low	Few-Medium	High	High	Slow	High	Low
Documents	Low	High	Few-Medium	High	High	Slow	High	Low

Table 3 .Comparison of different media and their capabilities. (Dennis et al. 2008)

As described in table 3, email is considered to be low in terms of synchronicity, which makes it more appropriate for conveyance communication (Dennis et al. 2008). This has been also notified in Task Closure theory (Straub & Karahanna, 1998), which also classifies email as low synchronicity medium.

Dennis et al. (2008) propose that the “best medium” for a given situation may be a combination of media. The use of mixed media or media switching can avoid the disadvantages of

both high social presence media and low social presence media while capitalizing on their advantages (Robert and Dennis, 2005). Also Saunders and Jones (1990) suggest that a variety of media are needed at different stages in the decision making process and that decision makers should manage the information flow via media selection to prevent information overload. Dennis and Valacich (1999) agree; media switching could provide the best performance for a task that requires both information dissemination and convergence on a decision (Dennis & Valacich 1999).

2.1.2.3. Media Appropriation

In addition to media –communication process fit, it is important to consider other factors influencing on communication performance. It is not solely the media or their capabilities that directly influence communication performance, but also the way in which they are appropriated and used (Dennis, Wixom & Vandeberg 2001; DeSanctis & Poole 1994). Three factors that influence the relative amount of conveyance and convergence processes: the familiarity that individuals have with each other, with the task, and with the communication media they use (Dennis et al. 2008). These three factors hold important implications for the impact of media use on communication performance (Carlson and Zmud 1999; Kock 2004).

Appropriation factors are claimed to improve process satisfaction and increase the number of ideas, when applied together with appropriate task-technology fit in the group support system usage. These factors were originally examined in relation to group support systems (Dennis et al. 2001). Once there is a task-technology fit, the provision of appropriation support to aid the incorporation of the GSS into the work processes improve efficiency by reducing time needed to perform the task, and improve participant's satisfaction with the process (Dennis et al. 2001).

Group support system is a social technology, so the way in which a group chooses to it, is affected not only by task-technology fit, but also by the fit of the technology with the group's habitual routines-the social structures that evolve slowly over time (DeSanctis & Poole, 1994) Media that fit user needs well are more likely to be faithfully appropriated and

used; media that do not fit the needs of the user very well are less likely to be faithfully appropriated and used (Dennis et al. 2008).

Appropriation is also influenced by other factors (Dennis et al. 2008); positive past experience and social norms can influence the likelihood that the media will be appropriated faithfully (DeSanctis and Poole 1994). Also familiarity with and training on the use of the media can increase the likelihood that the media will be appropriated faithfully (Dennis et al. 2001; DeSanctis and Poole 1994).

The need for synchronicity provided by media is influenced by level of familiarity with communication partners, with the task, and with the media (Dennis et al. 2008). Thus, Dennis et al. (2008) suggest, that individuals working together with well established norms working on familiar tasks using familiar media have lower requirements for synchronicity provided by medium. Thus, if the communication partner and task are familiar, media does not need to be that synchronised and good communication performance level can still be achieved.

Appropriation support can be provided in the form of training, facilitation, prior group experiences and group organisational policies and norms. It is expected that a good fit without the needed appropriation support is less likely to lead to improved performance. (Dennis et al. 2001)

2.1.3. Communication Media Repertoires

Watson-Manheim and Belanger (2007) present Communication Media Repertoires as the lens through which media usage by individuals in complex communication-based work settings can be explored. Their research aimed to explore how workers use communication media simultaneously or sequentially, to complete interaction with colleagues. Media Repertoires is used in this study for describing the factors, other than potential communication performance, influencing on media choices in organisational communication. These factors influence for example organisation's influence as well as situational factors as described in figure 2. Central concept is the one of media repertoires - the variety of communication media available in organisation, which is going to be introduced in the first part of this chapter.

Communication Media Repertoires complements Media Synchronicity Theory by defining the perceived media options available for employees. Given the fact that media selection may be subject to less objective social influences (Saunders & Jones 1990), communication media repertoires (Watson-Manheim & Belanger 2007) brings along theoretical perspective of organisational norms and practices in this study. Watson Manheim & Belanger (2007), posit that organizational members select a communication medium or a combination of media from their communication media repertoire for use in interactions with colleagues, as can be seen from figure 2. These institutional and situational factors are going to be discussed in the second part of this chapter.

Other media selection theories usually examine the usage of one, single media, which is very limiting (Watson-Manheim & Belanger 2007). By adopting Watson-Manheim and Belanger's (2007) approach, valuable insights of multiple media usage can be gained, which is important considering the wide repertoire of digital communication media available.

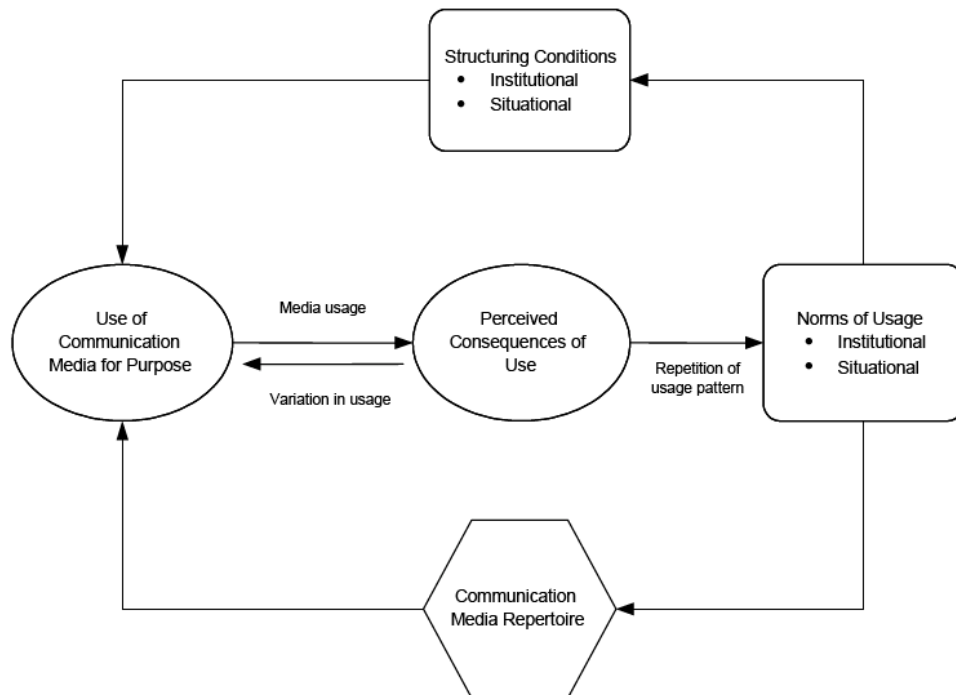


Figure 2 Proposed framework for investigating Communication Media Repertoires (Watson-Manheim & Belanger 2007)

2.1.3.1. Perceived Media Repertoires

Perceived media repertoires limit and define the range of communication media selection for employee. Watson-Manheim and Belanger (2007) define media repertoire as “the collection of communication channels and identifiable routines of use for specific communication purposes within a defined community”. Proposed Communication Media Repertoire approach is adapted from genre repertoire (Orlikowski & Yates, 1994). To be able to choose media, individual has to expect that it is available.

According to Orlikowski and Yates (1994), community's genre repertoire indicates its established communicative practices. Once a community has established a genre repertoire, that repertoire structures members' communicative actions, even as members continue to reinforce and change the genres that constitute it (Orlikowski & Yates 1994). Orlikowski and Yates (1994) describe that a genre of organizational communication, such as the business letter, shareholders' meeting, or report, is a distinctive type of communicative action, characterized by a socially recognized communicative purpose and common aspects of form.

When a community is formed, its members come to some understanding, about the set of genres they will use to interact as a collectively; this initial set of genres is often based on members' communicative experiences and genre knowledge gained in other communities (Orlikowski & Yates 1994). Ongoing interaction by members of the community will tend to draw on and reinforce the genres established within the community, and, over time, the genre repertoire will become increasingly taken for granted as an aspect of the community's organizing process (Orlikowski & Yates 1994).

Orlikowski and Yates (1994) claim genre repertoire possibly to be particularly useful for investigating the introduction, use, and influence of new media in organizations. By examining the structuring of communicative practices in detail, it should be possible to gain insights into the types of changes that may occur as a result of introducing new media (Orlikowski and Yates 1994). The genres through which information is shaped and shared for particular purposes are no longer merely an aspect of organizational work; rather, they are the organizational work (Orlikowski and Yates 1994).

Based on genre repertoire research, Watson-Manheim & Belanger (2007), suggest that organizational members select a communication medium or a combination of media from their communication media repertoire for use in interactions with colleagues. They consider the repertoire to include the collection of communication media used by organizational members, as according to Orlikowski and Yates (1994), the concept of a repertoire also includes the existence of socially established rules regulating the use of different genres within the community. Thus the organisational culture and habits may have strong influence on individual's media usage and the repertoire they perceive to be available.

Watson-Manheim & Belanger (2007) draw on a technology in- practice perspective whereby rules regulating use of technology are developed through recurrent use of the technology (Orlikowski 2000). From this perspective, employees develop an understanding of how and when to appropriately use particular media for organizational communication purposes such as coordinating or sharing knowledge (Watson-Manheim & Belanger 2007).

In their study, Watson-Manheim and Belanger (2007) found evidence that in both firms media was used concurrently, either to conduct parallel discussions or perform additional work (i.e., multitasking). So for example employees might send email then follow up with a voice mail, and then with a text message (Watson-Manheim & Belanger, 2007). This is consistent with task closure theory (Straub and Karahanna 1998), which claims that if trust is low, people express less confidence in the promises made and thus conduct multiple communicative acts.

2.1.3.2. Institutional and Situational Factors influencing the Media Choice

Active area of research related to communication media choices has been on the influence of contextual factors, which have been found to significantly influence the decision to use a communication medium (Watson-Manheim & Belanger, 2007). At the time of action the communication media repertoire, as well as the individual understanding of the situation and structuring conditions, influence media usage decisions (Watson-Manheim & Belanger 2007). The existing repertoire of practices provides a frame through which usage decisions are made (Watson-Manheim & Belanger; Orlikowski and Yates 1994). However, changes may be made based on the understanding of the specific situation and events at the time of the usage decision (Watson-Manheim & Belanger 2007). According to Watson-Manheim and Belanger (2007), structuring conditions have two components: institutional conditions and situational conditions. For example, urgency of the communication event influences the choice of medium (Trevino et al. 1987). Also Saunders and Jones (1990) investigate a number of contextual factors (e.g., number of concurrent decisions to make, time pressures, perceived importance of the decision, value premises).

Institutional conditions include both physical and social structures; community norms, encouragement for use, public social contexts, compensation practices, interpersonal trust and physical work place structure (Watson-Manheim & Belanger 2007). As the number of media available to employees increases, it has effects not only on organizational tasks and performance, but also on media behaviours (Watson-Manheim & Belanger 2007).

Particularly important for understanding the routine use of a range of communication media in the performance of work activities are community norms, or socially established regulating behaviours (Watson-Manheim & Belanger 2007). Influence of communication norms and rules for interaction in the usage of media within work groups have been shown in previous studies (Markus 1994). Behavioural norms shape the understanding of the medium, and the advantage that is gained from its use (Te'eni 2001). Further, communication media users develop an understanding of a communication medium that has influence on their perception of capabilities of the medium and consequent usage behaviour (Markus 1994).

The influence of organizational norms on communications media use has been demonstrated in multiple studies (Fulk, 1993; Markus, 1994; Watson-Manheim & Belanger, 2007; Yates & Orlikowski, 1992). Research suggests that strong social and organisational encouragement for use of email influences the decision to use this medium (Markus 1994). Public social contexts such as meetings can affect employees' perceptions of appropriate work behaviours as they observe how others use and talk about using ICT in various settings (Stephens & Davis 2009). Watson-Manheim and Belanger (2007) also note, that organisational compensation practices may influence on media usage.

Watson-Manheim and Belanger (2007) also remind that interpersonal trust has important implications for conducting organisational work activities, and present a new dimension to this research; evidence was found that level of trust influence behaviour and usage patterns of the media. In summary, Watson-Manheim and Belanger (2007) present that institutional factors like physical structure of work unit, social structures (especially interpersonal trust) and incentives for use of different media appear to influence on employees media perceptions and usage.

Watson-Manheim & Belanger describe that while institutional factors influence preference for the use of communication media repertoires both directly and indirectly, "employees also report varying the use of media depending on their understanding of factors specific to a given communication undertaking". Watson-Manheim and Belanger (2007) label these situational factors, which according to them is similar to Markus (1994). According to Mar-

kus (1994), situational factors have also been argued by information richness theorists (Trevino et al. 1987) to influence media choice, even though they were not included to the original theory.

Watson-Manheim and Belanger (2007) define the following as situational factors: task characteristics, message characteristics and urgency. For example, evidence is found that when message is sensitive, face-to-face or phone interaction is preferred (Watson-Manheim & Belanger, 2007). Watson-Manheim and Belanger (2007) also elaborate, that in their study employees mention the difficulty of conveying a sense of urgency in email because there are too many emails and some people do not respond to them.

It has to be noted, that Watson-Manheim and Belanger's (2007) list doesn't cover all the situational factors. As Straub and Karahanna (1998) claim, that recipient availability, when compared simultaneously with other media choice determinants, proved to be a key media choice construct. People tend to choose high social presence media if message is urgent. (Robert & Dennis, 2005) Studies have found that availability is closely associated with why organization members choose certain media or technologies (Straub & Karahanna, 1998). In particular, these studies have indicated that asynchronous media such as email or voicemail are likely to be used when the intended recipients are not temporally available (Lee et al. 2009)

In addition, Markus (1994) defines for example the location of sender and receiver as a situational factor. Thus, these factors should be added to situational conditions in communication media choices. In addition, other contextual factors influencing on media usage choices are familiarity with technology and task (Carlson and Zmud 1999; Fulk 1993), group size (Miranda and Saunders 2003), and the level of job pressure and task routineness (Fulk 1993). Timmerman (2002) suggests that incoming medium may play an important role in determining which medium is subsequently selected. As such, the incoming medium may represent an additional variable that may moderate whether media richness and social influence constructs are predictive of media use (Timmerman, 2002). Thus, it has to be taken into consideration as situational factor in this study.

2.2. Challenges Related to Communication in Knowledge Work

The theoretical perspectives provide lenses for the present study to investigate the challenges related to communication experienced by individuals in knowledge-work organisation. It is important to understand the challenges to be able to discuss the factors hindering efficient communication. This section supports solving the sub question *“What is experienced as challenging in organisational communication”*.

In this chapter, employee welfare, downsides of electronic media in relation to interruptions, task performance, information overload and stress are discussed. In the second part of the chapter, Cognitive model of media choice (Robert & Dennis, 2005) is introduced for describing the link between the challenges and inefficient media choices. Media Synchronicity theory (Dennis et al. 2008) presented earlier provides the general understanding for the efficient use of media, but Cognitive Model of Media Choice (Robert & Dennis, 2005) provides deeper understanding for the possible mechanisms how the problems origin in organisational communication; what actually happens when the wrong media is chosen.

2.2.1. Electronic media, interruptions, overload and task performance

Electronic media and information overload seem to have linkage to work-related stress employees experience. There are several theories trying to explain the causes and effects of these problems in organisations. Straub and Karahanna's (1998) qualitative findings suggest that inability to bring task closure results in increased stress for message initiators. For example, 64% of respondents indicated that they experienced stress whenever they were not able to complete a communication act, which is consistent with findings that subjects perceiving greater personal control over work experience less anxiety (Perrewe and Ganster 1989 in Straub & Karahanna, 1998) Also Kirmeyer (1988) has noticed, that the inability to bring closure to task sequences results in fragmentation of work and higher levels of stress.

The asynchronous quality of new media such as email, voicemail, and fax (Straub and Karahanna 1998; Dennis et al. 2008) may play a critical role in enabling message senders to bring closure to communication act, meaning that individuals choose asynchronous media like email to avoid having to engage in repeated acts of messaging to bring closure to the communication act. Use of new media may serve as a key psychological role in significantly lowering worker stress and frustration (Straub & Karahanna, 1998). Also Taylor et al. (2008) and Dennis et al. (2008) have argued that one of the advantages of email communication is that it allows messages to be sent without interrupting the recipient. The ability to contact people without interrupting them is a feature of email that may have an empowering effect for people with a related anxiety (Taylor et al. 2008).

However, it is noticed that interruptions may be disruptive to people engaged on a task (Taylor et al. 2008). Modern broadband technology allows personal computers to check for new email every minute, and the application can be set to provide an alert upon receipt of a new message; these innovations provide opportunities for frequent interruptions, which may be detrimental to work productivity (Taylor et al, 2008).

Interruptions seem to be an extensive challenge. According to Finnish research (Työ & Terveys 2006), half of the employees were forced to often or constantly interrupt their current work tasks to give way to more urgent tasks. According to the same research, when looking at the field specific numbers, interruptions are most typical in commercial work (68%) and administration- and office work (68%). When looking into the nature of the tasks, most interruptions (61%) occur in knowledge-work (Työ & Terveys 2006).

Given the trend, closing task with asynchronous media like email might have turned against itself. A common complaint of email users is its impact on their workload. A large survey by the Australian Psychological Society (APS 2003) found that 80 per cent of workers spent more than 20 per cent of their day dealing with emails. So, employees might try to close task to avoid stress b sending emails, but actually this kind of logic increases the message load and interruptions tremendously in a long term.

According to Whittakers (2005) study, users often complain about feeling overwhelmed by the volume of messages they receive and they also seem to have difficulties to organize and manage their email data (Whittaker, 2005). Email usage is problematic in many organisations; it is used for sharing large attachments, and after a while there is multiple different versions, which increases the risk that someone uses the wrong one (Ojala & Pöysti, 2008, 55) Employees have difficulties in organizing and managing their email data; most importantly, they have problems in using email to execute “collaborative tasks.” (Whittaker, 2005) It is important to recognize, that email was never aimed to be a group support tool (Ojala & Pöysti 2008, 28). There are tools much better suited for cooperation and file sharing than email. As Ojala and Pöysti (2008, 55) note, it is useful to replace part of email traffic with wikis, where the latest and correct information is always available for all the participants.

In addition, emails are often poorly targeted. In their study within a large international organisation Kimble, Hildreth, and Grimshaw (1998) found that some managers were overloaded with emails because of the inappropriate use of the carbon copy (cc) function. Burgess et al. (2005) posit that employees may often copy emails to their superiors simply to “cover their own back”. The cc function is also often used to send emails that are for information only and do not require action; however, the recipient does not know this and has to spend time processing the message (Burgess et al. 2005).

Thus, it seems that in addition to constantly occurring interruptions, there is overload of messages in organisation, which is especially caused by email usage. As Kirmeyer (1988) posits, interesting explanation for a direct link between coping and load is suggested by research demonstrating that often-repeated and well-learned actions may be engaged in a relatively automatic or mindless fashion (Langer, Blank, & Chanowitz, 1978 in Kirmeyer, 1988). Langer (1978) suggests that when people process incoming information, they systematically ignore information. Prior scripts are used in processing; scripts were written when similar information really was once new, and then applied over and over again (Langer, 1978). Thus, the part of information, which is processed, is not necessarily the most important part (Langer, 1978).

It seems that employees are more rushed nowadays; between the years 2003 and 2006 a clear increase occurred in Finland. More than a half of employees had to hurry often or very often to get the tasks completed (Työ & Terveys 2006). Given the fact that employees feel rushed, it is very likely that a lot of information may be systematically ignored, because there simply is not time to go through all the information received.

2.2.3. Link between communication media choices and decision quality

The problems described in the previous chapter seem to indicate, that besides providing advantages, media and technology bring along multiple challenges to organisational communication. To better understand, why these problems like difficulties dealing with emails origin, and why is it important to choose appropriate media for task, Cognitive Model of Media Choice –theory (Robert & Dennis, 2005) is introduced.

Theory is used in this study for linking the media choices to organisations and individual's communication efficiency and performance, highlighting the decision quality and productivity. The assumptions of the Cognitive Model of Media Choice, like paradox of richness, are present in Media Synchronicity theory (Dennis et al. 2008) in some degree, but the issues need to be emphasised more deeply in this chapter to better understand the possible challenges. Cognitive model of media choice theory and its ideas can be seen as a result of media choices in terms of elaboration likelihood, but it also influences on media choice itself in some degree.

Robert and Dennis (2005) argue that there is a paradox embedded within the use of rich media. Previous research seems to confirm that individuals prefer media low in social presence (asynchronous like email) for processing large amounts of information and on the contrary, media high in social presence (synchronous like phone) for small amounts of information (Robert & Dennis 2005; Hrastinski 2008).

Robert and Dennis describe, that the use of synchronous media induces increased motivation but decreases the ability to process information, while the use of asynchronous media induces decreased motivation but increases the ability to process information (see figure 3). When a message is sent via asynchronous medium, the receiver has more time to comprehend the message (Robert & Dennis, 2005). Synchronous communication increases user motivation but made it harder for them to process information (Hrastinski 2008; Robert & Dennis 2005). On the other hand, as Robert and Dennis (2005) and Hrastinski (2008) argue, the receiver had more time to comprehend an asynchronous message since there was no need to respond quickly.

Robert and Dennis (2005) use the elaboration likelihood model (ELM), one of the dual process theories of cognition as the fundamental theoretical framework. Elaboration likelihood model posits that in order to change someone’s understanding and attitude, the receiver has to be motivated to think about the message and has to have the ability to process the message (Robert & Dennis, 2005.) ELM, introduced by Petty and Cacioppo (1986) provides a framework for organizing, categorizing, and understanding basic processes underlying the effectiveness or persuasiveness of communication (Robert & Dennis 2005). There are two separate routes to persuasion which might occur; central and peripheral route (Robert & Dennis 2005). Petty and Cacioppo (1986) claim that motivation and the ability to process the information determine which route individuals will employ.

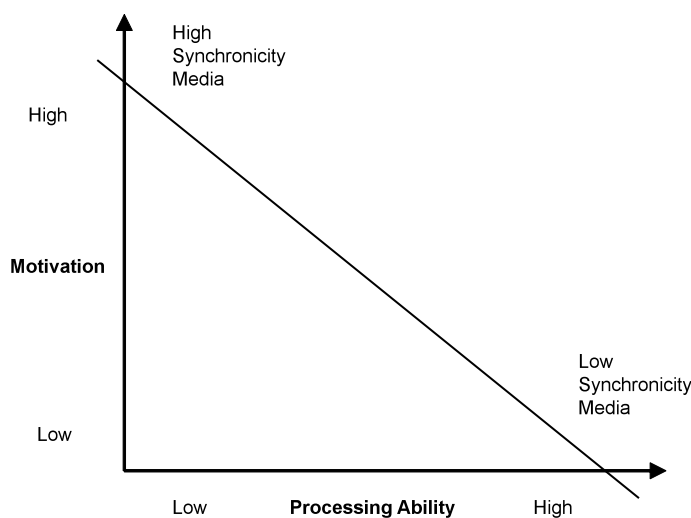


Figure 3 Inverse relationship between processing ability and motivation (Robert & Dennis, 2005)

But why is processing ability and motivation so important? The answer is the resulting level of decision quality, which is extremely important aspect in knowledge work. First, Robert and Dennis (2005) propose that “the extent of elaboration is positively related to decision quality”. Receivers who agree to use high social presence media will have high levels of attention and be motivated to process the message (Robert & Dennis, 2005). Second, Robert and Dennis (2005) argue, that “individuals who receive complex message sent using a high social presence medium will reject the message, delay the decision, or look for peripheral cues”. On the contrary, individuals who are faced with a complex message sent using a medium with low social presence and who are motivated will elaborate on the message - complex messages require a high ability to process because humans have limited extended working memory (Robert and Dennis 2005). Thus, using wrong media for wrong purpose may delay the decision-making or information processing, or lower the decision quality of employees. These suggestions may provide explanation to the challenges experienced in knowledge-work.

Unless individuals fully consider the messages they are presented with, they cannot constantly make good decisions based on the information (Robert & Dennis, 2005). High elaboration leads to better decision making between individuals performing decision, problem, and judgment tasks within an organization/work team environment (Robert & Dennis, 2005). In addition, when senders require an immediate response from the receiver, they will choose a medium with a higher social presence (Robert & Dennis, 2005). The “urgency” or need for immediate attention, coupled with the task, has proven to be an important determinant of medium selection (Straub & Karahanna1998). Though, using rich medium in this case is more convenient for the sender, but may cause problems and inconvenience for the receiver, and lower processing ability of the message. This may increase challenges experienced in organisational communication.

As critique it must be said, that Cognitive Model of Media Choice is somewhat deterministic; it is, after all, the users and not the medium that determine whether asynchronous or synchronous operation occurs (Hrastinski 2008). However, a medium might better support synchronicity because of its characteristics (Hrastinski 2008).

2.3. Conceptual Framework

To discover the factors hindering efficient communication in knowledge-work organisation, two sub questions were presented. The frameworks are essentially created for these sub questions based on combining results and models from recent literature. The results from these two frameworks are expected to lead in to finding the factors, which are preventing efficient communication in organisation.

What are the factors influencing on individuals' media choices in knowledge-work?

→ *Framework 1: factors influencing on media choices*

What is experienced as challenging in organisational communication?

→ *Framework 2: Challenges experienced in knowledge-work organisation*

Framework 1, Factors influencing on media choices, is applied as the main research framework in this study; all the factors influencing on media choice can in theory be hindering the efficient media choices and communication. This framework (figure 4) for empirical research is presented first, and is created by the researcher based on combination of Media Synchronicity Theory (Dennis et. al, 2008) and Communication Media Repertoires (Watson-Manheim & Belanger. 2007).

Next, second framework, Challenges experienced in knowledge-work organisation, is presented (figure 5). Framework is composed based on drawing together the findings of the problems and challenges experienced in knowledge-work. It is important to understand the link between the media choice and challenges experienced. In the end of this chapter, together with the second framework, Cognitive Model of Media Choice (Robert & Dennis, 2005) is used for describing the phenomenon.

2.3.1. Factors influencing on media choices in knowledge-work

Suggested framework one describes the factors perceived to influence on individuals communication behaviour and choices in a knowledge-work organisation. Media Synchronicity (Dennis et al. 2008), and Media Repertoires (Watson-Manheim & Belanger 2007) are combined to gain a comprehensive understanding of the media choices and factors influencing on them.

Media Synchronicity Theory (Dennis et al. 2008) is considered being the “*rational media choice*” theory, given the expected communication performance due to efficient fit between task and media. Individuals are expected to match the communication process or task to relevant media based on media’s capabilities (Dennis et al. 2008). This fit is presented at the right hand side in the figure 4. Related to this area, conveyance and convergence processes are considered in some extent. Framework also includes the perceived capabilities different media possesses. It is possible, that employees perceive the capabilities of the media wrong and thus are not able to match the task to media, which might pose barriers to efficient communication. Also, it has to be clarified to which extent the expected performance influences on media choice.

On the left side in framework one (see figure 4), *structuring conditions* influencing on communication behaviour are presented. This part presents the factors other than rational efficiency, which possibly influence on the media choice. As well as regarding the rational media choice, it is possible to find factors hindering efficient communication amongst these structuring conditions. Even though media synchronicity and efficiency would be considered rationally, these structuring factors may influence on choice and thus alter resulting efficiency. These structuring factors composed by a researcher of this study include features from Communication Media Repertoires theory (Watson-Manheim & Belanger 2007) as well as Appropriation factors adjusted from MST (Dennis et al. 2008).

Communication Media Repertoires (Watson-Manheim & Belanger, 2007) provide the theory with the following factors; Institutional conditions (physical structures, interpersonal trust,

organisational incentives and social norms); situational conditions (urgency, recipient availability and locations) and perceived media repertoire the employee has possibility to use. Watson-Manheim & Belanger (2007), posit that organizational members select a communication medium or a combination of media from their communication media repertoire for use in interactions with colleagues. The existing repertoire of practices provides a frame through which usage decisions are made (Watson-Mangeim & Belanger; Orlikowski and Yates 1994). However, changes may be made based on the understanding of the specific situation and events at the time of the usage decision (Watson-Manheim & Belanger 2007). Thus it is important to investigate the influence of situational conditions as well as perceived repertoires further.

Appropriation factors include training and past experience with the media as well as familiarity with media, partner, and task at hand. It is not solely the media or their capabilities that directly influence communication performance, but also the way in which they are appropriated and used (Dennis et al. 2001; DeSanctis & Poole 1994). Appropriation factors in Media Synchronicity theory (Dennis et al. 2008) include social norms in addition, but in the framework one (figure 4), institutional conditions already include it, so they are excluded from appropriation factors.

Overall, in this study, institutional conditions more emphasize norms, practices and culture, which is not necessarily articulated clearly, but experienced by employees. Appropriation factors are more related to experiences before and outside organisation, but also include formal training for the media usage. It is expected that a good fit without the needed appropriation support is less likely to lead to improved performance (Dennis et al. 2001). On the other hand, institutional conditions more influence on the perceived organisational approval and silent, social encouragement for usage, which forms through understanding of social norms. This may emerge for example as assumptions of the most preferred or relevant media in organisation.

Media choice further contributes to Elaboration Likelihood either in a negative or positive manner. This is described in Cognitive Model of Media Choice (Robert and Dennis, 2005).

However, there is also perceived influence to the other direction; if elaboration likelihood is low, e.g. information is not being processed or there is no motivation/attention to communication, information might be missed and media choice conducted in a mindless state. According to Timmerman (2002), when collapsing across the mindlessness/mindful conditions, Media Richness, a commonly used theory in the field of communication behaviour research, explanations accurately predicted only 37% of the participants’ media use. This is especially a problem in complex communication situations as well as when information overload is present and employees don’t have time to concentrate properly. This might further accumulate the inefficient media choices. Thus, also the role of continuing the same channel (incoming medium) has to be taken into consideration.

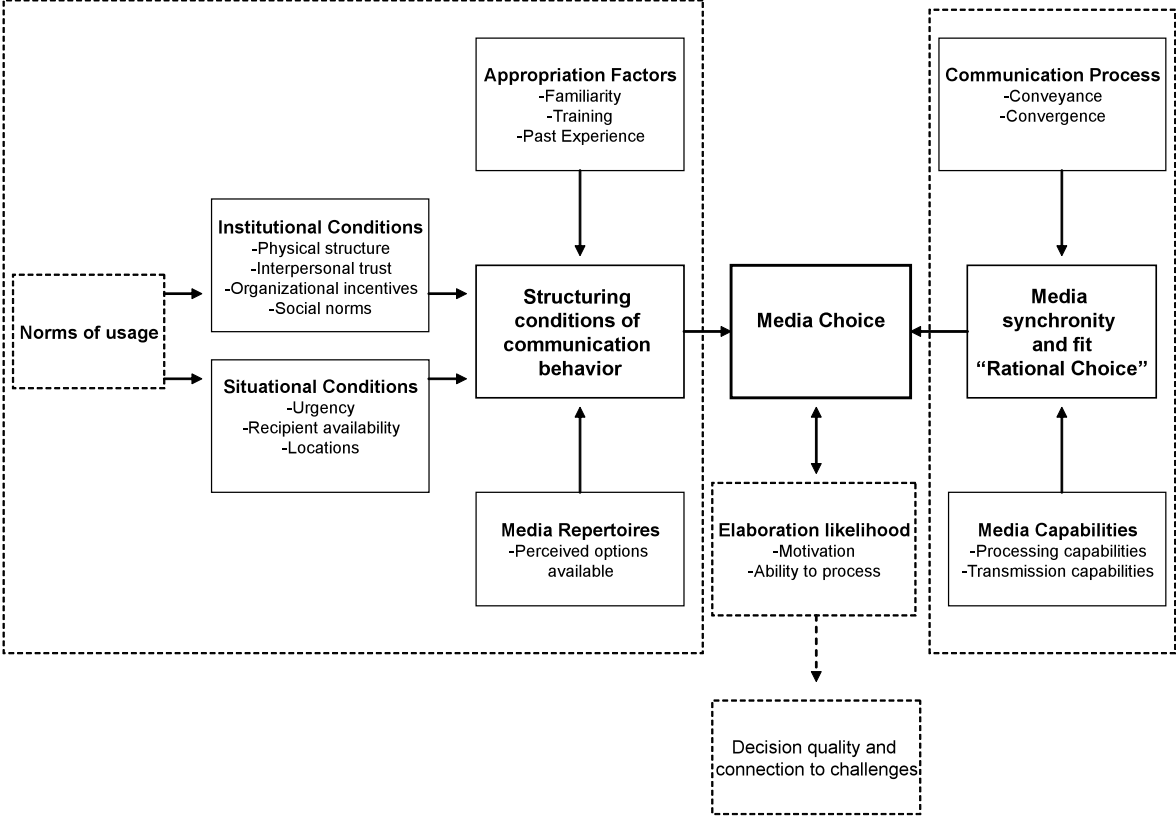


Figure 4. Framework 1 - Factors influencing on media choice

2.3.2. Challenges experienced in organisational communication

So what kinds of challenges occur in organisational communication, if media is not chosen efficiently? In this study, problems experienced by employees are explored, but the main emphasis is on the challenges, which might occur due to wrong kind of communication media usage. If the media choice and communication is done in an efficient way, where media is matched to task, and the result is comprehended message resulting in high elaboration likelihood, there is a theoretical linkage to quality decisions and productivity according to Robert and Dennis (2005). Also negative effect may emerge, in cases where media choices are not efficient and information overload emerges. This might lead into higher stress level of employees and unproductive organisation, when employees have difficulties to deal with messages they receive. These consequences and challenges from individual's viewpoint are empirically examined.

Framework 2 (figure 5) presents the theoretical problems employees might experience or face in their everyday work related to inefficient communication. Figure 5 draws together the different findings from previous research. Inefficient media usage and low elaboration likelihood seem to lead into high level of interruptions and information overload. It is possible, that when individual experiences overload and interruption, stress level increases and situation has to be coped with somehow; task closure attempts and mindlessness information processing and media choices occur.

When considering the disadvantages and excessive amount of emails knowledge workers have to deal with, it looks like Task Closure theory (Straub & Karahanna, 1998) might not be as positive as it was before. Even though the productivity of individual would increase, it seems that the overall productivity of the organisation may actually decrease because of lower decision quality. In addition, the inability to bring closure to task sequences results in fragmentation of work and higher levels of stress (Kirmeyer, 1988). Asynchronous media provides an option to close tasks while not interrupting recipient (Straub & Karahanna, 1998). However, always on broadband and other innovations might increase interruptions, which may be detrimental to work productivity (Taylor et al, 2008). Increased email load

may occur because of task closure attempts, which might accelerate due to information overload in knowledge-work environment.

Kirmeyer (1988) has been focusing on mindlessness fashion of processing things when they are often repeated and well learned. When processing incoming information, only a minimal amount of structural information may be attended to, and that this information may not be the most useful part (Langer, 1978). Thus, it seems that people tend sometimes to for example read and forward emails in mindless state of mind to cope with overload, which might lead into low elaboration likelihood and inefficient information processing, when the information is not processed in a full meaning, which has a negative impact on decision quality. Also Timmerman's research (2002) supports the theory; according to him, media capabilities and social influence seem to explain fewer than 40% of media choices, which doesn't leave much room for rational thinking.

As Robert and Dennis (2005) explain, in circumstances where individuals are not motivated or do not have the ability to process information, they will not allocate processing effort toward a received message and will not fully integrate the information with their previous knowledge. When this occurs, the elaboration likelihood is described as being low (Robert & Dennis 2005).

As described, there are potential challenges in organisations related organisations performance. It is unclear and out of the scope of this study, what is the relation of these issues, their causes and effects in real-world context. Though, the following conceptual framework is presented based on theory to provide some degree of clarity to the problems and their relations. It is possible, that these are the problematic issues related to low elaboration likelihood, which could be improved by paying more attention to efficient media usage in inter-organisational communication.

Do people then actually experience problems in their work? What kind of issues there is in work-related communication? Are there any new factors, which are not noted in theories

influencing on or resulting from communication behaviour? With the aid of empirical research it is examined, if these problems are experienced in case organisation.

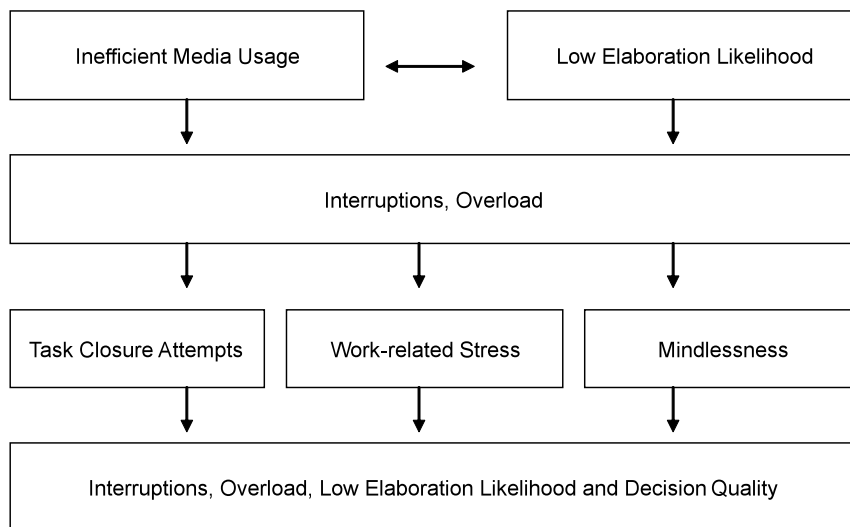


Figure 5 Framework 2 - Challenges experienced in knowledge-work

Cognitive Model of Media Choice helps in understanding the phenomena and to indicate the efficient usage of media. Figure 6 illustrates the relation of media choices and challenges experienced and their effects in knowledge intensive work. This is a combination of Cognitive Model of Media Choice (Robert and Dennis, 2005) presented in the chapter 2.2 (Challenges) and Media Synchronicity Theory (Dennis et al. 2008). Media is presented on a line in terms of processing ability and degree of motivation according to MST (Dennis et al. 2008)

The basic axes are from Cognitive Model of Media Choice; when the social presence of media is high, motivation to concentrate on communication is high and vice versa. Social presence and synchronicity definitions of different media match, so according to both theories the media settle down to same location on line.

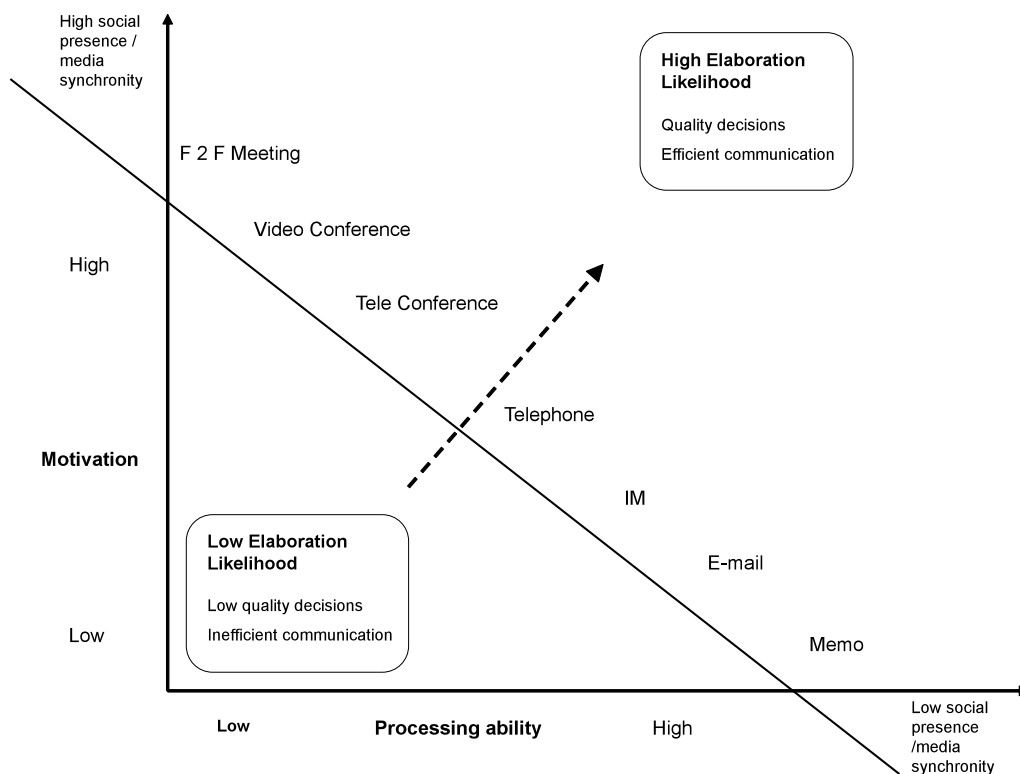


Figure 6 Link between media choices and problems experienced

Thus in the figure 6 the basic theoretical model and background is provided to describe what kind of communication media in theory is efficient in which communication situation and in terms of elaboration likelihood/cognitive processing. Figure helps visually to understand how the different media are located to the paradoxical motivation-processing ability field. Based on the model of Robert and Dennis (2005), elaboration likelihood is low when media is used inefficiently, and lot of information is missed. Different challenges experienced, which are related to organisational communication, may result due to wrong media selections. These problems, their possible causes and effects were previously explained and illustrated in the framework 2 (figure 5).

In theory, media should be matched to task so that communication performance would be high. In situations, where inappropriate media is selected possibly due to influence of structuring conditions, low elaboration likelihood is expected to emerge, which leads into ineffi-

cient situation and problems experienced by employees. This is demonstrated in the down-left hand corner. The arrow in the figure 6 describes the possibility to alter the media choices of individuals and thus influence on the communication efficiency and outcomes. By influencing on structuring condition and clarifying the rational media choice, management may be able to improve the organisational efficiency and lower the barriers hindering efficient communication. Also, it has been presented that media switching or usage of mixed media might provide the best performance (Dennis & Valacich 1999; Robert & Dennis 2005; Saunders & Jones 1990) Processing capabilities and transmission capabilities, which form Media capabilities in MST (Dennis et al. 2008) can be considered as more detailed description for Cognitive models motivation and ability to process dimensions. Both Cognitive Model of Media Choice and MST define email as asynchronous media.

To summarize, according to Media Synchronicity and Cognitive Model of Media Choice, there is an efficient media with different degree of synchronicity for particular task. It is possible, that the challenges related to communication are experienced, because individuals don't choose the media accordingly to purpose, or understand the theoretical efficiency. Also, structuring conditions presented in framework one (figure 4) may provide explanations to the inefficient media usage and possibly originating challenges.

3. Methodology

In this section, the research strategy chose for this study is presented, after which the data collection and analysis techniques are explained. The reliability and validity issues of the study are discussed along with these chapters.

3.1. The research strategy, approach and delimitations

Yin (2003, 5) has named three areas contributing to the choice of the research strategy; type of the research question posed, the extent of the control researcher has over actual behavioural events and the degree of focus on contemporary as opposed to historical events. It has been acknowledged, that the explanatory type of research questions like how and what are likely to favour the use of case studies, field experiments and histories. The case study is also preferred in examining contemporary events, but when the relevant factors cannot be manipulated. Case study relies on many of the same techniques as history, but direct observation of the events and interviews of the persons involved in the events can be added as sources of evidence. (Yin 2003, 5-10)

Field experiments would not be possible in this particular case study given the complexity of the case, it would not be possible for the researcher to manipulate behaviour systematically and include all the variables, given the complexity of phenomenon (Yin 2003, 6-8). Given the criteria and guidelines stated above, the case study approach was chosen as the strategy of this research.

Case study investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 2003; Dubois & Gadde, 2002). In the organisational communication behaviour research the phenomenon can't be separated from the context; it is essential to include the situational and contextual factors into examination. For example, the experiment would separate the phe-

nomenon from its context, so that attention can be focused on only a few variables (Yin 2003, 13), which would ignore important aspects of the phenomenon in question. Surveys can try to deal with the phenomenon and context, but their ability to investigate the context is extremely limited (Yin 2003, 13). This said; the case study strategy seemed to be the right choice for this research.

In general, for case studies, theory development as part of the design phase is essential, whether the case's purpose is to develop or test the theory (Yin 2003, 31-32). The appropriately developed theory is the degree in which the results can be generalized; in case studies, instead of statistical generalization, analytical generalization is applied (Yin 2003, 31-32). Thus the problem of generalisation can be overcome in this study. However, there is also another kind of approach to theory development used in the abductive research approach, which is the chosen approach for this particular study. Dubois and Gadde (2002) present research approach called systematic combining, which is characterised by continuous movement between an empirical world and a model world. This approach lets theoretical framework, empirical fieldwork and case analysis evolve simultaneously, and is useful especially for development of new theories (Dubois & Gadde 2002). The systematic combining is an argument for a stronger reliance on theory than it is suggested by true induction, but it is also very distant from deduction. Abduction is about investigating the relationship between everyday language and concepts, which is similar to induction; though, the logic of abduction is different. (Dubois & Gadde, 2002)

According to Dubois and Gadde (2002), the theory cannot be understood without empirical observation and vice versa; the evolving framework directs the search for empirical data. Empirical observations may result in identification of unanticipated but related issues. This on the other hand may bring the further need to redirect theoretical framework through expansion or change of theoretical model (Dubois & Gadde, 2002). The objective of any research is to confront theory with the empirical world, and in systematic combining approach this confrontation is more or less continuous throughout research process (Dubois & Gadde, 2002).

In regard to the research framework, Dubois and Gadde (2002) suggest a tight but evolving framework. The framework is successfully modified partly due to empirical findings, partly the new relevant theories (Dubois & Gadde, 2002). Systematic combining builds on existing theories, not generate a new one out of nowhere, but the objective is still to discover new things. (Dubois & Gadde, 2002) In this study, the chosen approach also ensures external validity; the strong theory background and carefully composed questions in research design increase external validity (Yin 2003, 33-37). Investigator triangulation further increased the degree of validity.

Age and gender are influencing on communication behaviour, but in this research they were left out of the scope. Communication processes and tasks are not the main focus of the research. They are necessary for gaining understanding of the media usage and context in relation to media capabilities, but are not going to be described in detail.

Specific usage of different media in different context leads theoretically different elaboration likelihood results. This helps in understanding the possible link between communication behaviour and challenges occurring. However, within this scope it is impossible to measure the processing ability and communication motivation of the employees empirically, so the linkage and explanation between the media choices and experienced problems is going to be purely theoretical. Empirically examined factors influencing on media choice decisions, the challenges in organisational communication and the key factors hindering the efficient communication resulting in challenges are presented, and as result it is possible that by influencing on the factors identified management can influence on organisational efficiency.

3.2. Data Collection

The case organisation of this study, TeliaSonera's Business Services Finland unit, represents well the contemporary knowledge-work environment. The case has possibility to provide interesting insights to occurring challenges, because in theory the unit should have all possibilities to efficient communication, after all we are talking about company operating at telecommunications field, but still the organisational communication is experienced as challenging. The sampling frame was thus the Business Services Finland unit. To increase the reliability of the case study, case study database was established (Yin, 2003, 102).

As stated by Yin (2003, 15), case studies can be a mix of quantitative and qualitative evidence. Though, Yin (2003, 83) presents six important sources of evidence: documents, archival records, interviews, direct observation, participant-observation and physical artefacts.

External validity can be achieved by using a theory base in research design (Yin 2003, 33-37). In this study, the interview questions were composed based on themes and questions used in recent research (Watson-Manheim & Belanger, 2007; Dennis et al. 2008), thus ensuring external validity (see appendix 1&2). When collecting data, construct validity tactics include usage of multiple source of evidence and establishing chain of evidence (Yin 2003, 33-37). With data triangulation the potential problems of construct validity can be addressed (Yin 2003, 99); multiple sources of evidence in this study are providing multiple measures of same phenomenon. Investigator triangulation refers to making use of different investigators with a different background in increasing construct validity (Yin 2003; 98); the researchers of this study had very different backgrounds and perspectives, and all of those have been incorporated to the interview questions. In this study, the empirical results are clearly linked to original research questions, and multiple source of evidence consists of:

Primary data sources:

- Primary data: 10 semi-structured interviews with the employees of TeliaSonera Finland (business unit in focus) in July-September 2010
- Supporting data: Expert employee and trainer interviewed regarding media usage in organisation. (Brief interviews for background information.)
- Supporting data: Communication Behaviour Survey conducted in TeliaSonera Finland (business unit in focus) on July 2010. (Survey sent to 221 employees, 113 responses; response rate 51 %.)
- Supporting data: Communication survey conducted in small- and medium size companies in Finland on August 2010 by TeliaSonera and researchers of this study, sent to 6030 companies, total 670 responses gained. 331 answers were gathered from the open questions, which was 49% of the finished answers to the whole survey.

Secondary data sources:

- Organisational brochures, documents, training materials and publications
- Employee Satisfaction Survey conducted in TeliaSonera Finland, Sweden and Norway on March 2010, (Invitation was sent to 3417 IT users, 1383 persons took part in the survey response rate being 40, 5 %))

The main method for attaining evidence for the case was conducting interviews. The sampling frame is was Business Services Finland unit, which includes 220 employees. The eligible number of interview candidates was thus 220, which posed the requirement for a two-stage screening procedure suggested by Yin (2003, 78). The first stage consists of collecting relevant quantitative data about the entire pool (Yin 2003 78), which in this study consisted of unit within TeliaSonera organisation. An internet-based survey was conducted to gain understanding of the current situation and individuals attitudes towards communication. The goal was to reduce the number of candidates into 10 with the aid of relevant criteria. The first stage was to separate the candidates who answered the whole questionnaire from the ones who did not finish; the respondents who did not finish were excluded because they are not considered to be as devoted to the topic as the ones who finished. However, it has to be noticed that the non-sampling error might occur at this stage; the employees who did

not answer to the questionnaire, or the ones who did not finish, might be different from those who did answer.

After this stage, candidates were contacted randomly. However, the target were to ensure that there are candidates from variety of age groups, work positions and sex to gain an extensive insight to the area of study. Especially important was to include employees with different job descriptions to understand the influence of work tasks on the communication media usage and challenges. Unfortunately due to budget and time restrictions it was not possible to include candidates from different locations to the interview process. Business Services Finland unit also has employees in few other cities in Finland in addition to Helsinki head office, but operations are mainly concentrated to Helsinki area.

The survey served also as quantitative data evidence in addition to interviews. It clarifies the current situation of the organisation and supports the interviews. It also served as help in drafting the relevant interview question thanks to the open questions included to survey. Expert and trainer interviews were used as supporting data, and in creating a clear picture of a current state of organisational communication and media usage, together with secondary data sources. Secondary data sources like organisational publications and intranet were used as supporting evidence to gain deep insights of the case organisation TeliaSonera.

The pilot case was conducted prior to the actual interviews to gain better understanding of the issues, which should be included to the case study, as Yin (2003 79) proposes. Pilot case was selected based on the convenient access amongst the pool of candidates in the organisational unit. The interview conducted was broad and general toned, which helped to understand the different aspects of phenomenon experienced by individual employee. These insights helped to guide the theoretical literature review into interesting tracks. Pilot case also convinced the researcher that one or two persons present in the interview in the actual study are the maximum; otherwise situation could be uncomfortable for the interviewee.

3.3. Data Analysis

In the data analysis phase, internal validity was established by constantly combining theoretical viewpoints with conceptual framework and empirical results. In addition, the analysis was addressing the most significant aspects of the case study. Rival explanations were also addressed and discussed in conclusions chapter; recognising rival explanations is important when addressing internal validity (Yin, 2003, 137). The beginning of the chapter provides insights to survey data analysis, whereas the second part deals with analysing the data gathered from interviews.

3.3.1. Survey data analysis

The survey conducted for gaining background and support information was analysed with the aid of cluster analysis in terms of quantitative questions conducted with the answer scale from 1 to 5. The respondents who did not finish the questionnaire were eliminated. Five clusters were formed based on questions about challenges related to communication.

Also the frequency distribution was formed and medians and means counted. The frequency distributions and means were conducted also for different groups were cases were selected on the basis of specific variable like IT skills or position in organisation. Though, these results from different groups did not indicate significant differences amongst respondents, thus they are not presented in this study, but are available by request from researcher.

Open questions included into survey were coded based on themes, first the answers repeated often were recognised, after which they were compared and divided into different, broader themes, and categorized into profiles. For increasing reliability and objectivity, two researchers coded the same evidence and the same findings were suggested. Using two researchers in analysing the data may increase the precision and objectivity of the analysis (Eskola and Suoranta, 214).

3.3.2. Interview data analysis

The main empirical evidence, semi-structured interview results, was analysed with thematic analysis and coding. As Eskola and Suoranta (1998, 174) describe, usually the first approach to data is usually conducted by dividing data to different categories, and it is possible to bring up themes which shed light on the themes of research problem; as a result, it is possible to compare the frequencies how often certain themes are present in the data. Kvale and Brinkmann (2001, 201) describe coding and categorizing to be approaches to the analysis of text; coding involves attaching one or more keywords to text segment whereas categorizing entails more systematic conceptualization of a statement, opening it for quantification. These terms are often used interchangeably, and Kvale and Brinkmann (2001, 202) explain that coding in its various forms is a key aspect of grounded theory and content analysis. Thus, coding seemed to be a relevant method for interview data analysis given the abductive research approach.

Categorisation means reducing long interview statements into few simple categories (Kvale & Brinkmann 2001, 203). Another term indicating similar approach is meaning condensation; Kvale and Brinkmann (200, 205) define condensation to entail an abridgement of meanings expressed by the interviewees into shorter formulations. Both of these terms somewhat describe the method used in this study.

In the analysis of interview data, different themes were searched and organised into categories. Conceptual framework was used as a guiding principle for categories, but was not considered as restricting elements; also categories found which were not included to original framework, were taken into account. Topics within these categories were further summarized into smaller entities to better be able to compare the answers. Once the important factors emerging in majority of interviews were found, the factors occurring often were searched, to gain understanding of the factors influencing on choices and the challenges experienced. Then, analysis within every interviewees responds was conducted. Aim was to

clarify, whether certain types emerge within respondents, and what is the relationship and connection of different factors to each others. This helped to clarify, which are the factors hindering efficient communication and media usage.

The following coding/thematic protocol helps to clarify the process and technique used and increases reliability. By using these protocols, the analysis could easily be conducted again:

A. Categorising interviews by themes, analysing the general orientation of single respondent in different categories

1. Interviews were written down, and then re-organised into themes based on the framework and the original question categories. Each theme category included several questions regarding the topic.
2. After organising the relevant answers into categories, a first analysis was conducted by drawing conclusion of the general type of the influence on choice based on each theme. The theoretical background was used as aid, not as restriction.
3. Then, the basic, dominant choice orientation of the interviewees was determined in each category (E.g. oriented to own convenience when choosing media, tendency to follow incoming channel, general attitude towards new technologies). Orientation was not concluded by the theoretical framework, but more based on the overall judgement of researcher based on all the answers and themes.

B. Analysing similarities between respondents based on theme categories

4. The second stage of coding was conducted. At this stage, the similarities between interviewees were searched based on the theory categories.

C. Searching for the relationships amongst the factors

5. When certain types were found among respondents, and factors within one interview were examined, as well as then comparing these types and factors to each other amongst all the interviewees, the importance and relationships of the

factors were determined. This stage is based on researcher's judgement and the relationships emerging within the interviewees' responses and comparisons.

D. Confrontation of theoretical framework

6. The final step was to confront the framework; each category of the framework was examined; was the component influential in the media choice or not. Some of the theoretical factors/categories were clearly present in the choice process, but often their relationship was very different to the ones in original framework. Few factors seemed to be key factors in the media choice process, limiting the influence possibilities of other factors. Also, few new factors, which were not considered in the original framework, seem to influence on individuals media choices. The key factors hindering efficient communication were identified.

D. Supporting the results with survey data

At this stage, the results were also compared to the answers and analysis of surveys open question regarding the media choices. It seems that the survey results somewhat support the found types (few different types of individuals whose choices and background is homogenous within the type category, but heterogeneous compared to other respondent types.) Survey results also highlight the extent of the challenges identified.

3.4. Process Description

Presented table 4 provides reader with understanding of the research process and actions related to different phases to clarify the process.

Steps	Activity	This Research
Selecting Cases	Specified population	Unit within TeliaSonera: Business Services Finland
	Specified research focus	Organisational communication and challenges
Getting Started	Theory review	Communication Media Usage and Choice theories
	Definition of research question	What are the factors hindering efficient communication?
Composing the framework	Theories, no hypotheses	MST, Media Repertoires
Crafting instruments and protocols	Multiple Data Collection Methods	Interviews, surveys, documents
Entering the field	Gathering background information	Internet survey; cluster analysis, frequency distributions and coding with open questions. Expert and training interviews.
	Flexible & opportunistic data collection	Semi-structured interviews and flexible coding methods
Analyzing data	Within-case analysis, multiple cases	Coding and categorizing data from 10 interviews
Confronting literature	Comparison with literature	Originally defined conceptual framework
Research closure	Re-shaping the framework, new theories	New factors added. Relationships of factors modified. Factors hindering the efficient communication established.

Table 4 Process Description

4. Case Description

Case organisation in this study is TeliaSonera, a large telecommunications organisation offering services in 20 countries. The research was conducted in Business Services Finland – the unit focusing on complex solutions sold to other companies. Communication media usage and practices, which is the focus of this study, is mainly primarily the interest of Business Services Finland unit. However, phenomenon has also significance at the corporate level, which is going to be described first with general view to organisation understand the importance of the study in broader context. In the second part of the chapter, the motivation and interest for conducting this study is at business unit level are discussed; description of characteristics of Business Services Finland unit helps to better understand the context this study could possibly be applied to in the future.

4.1. Targets at corporate level

TeliaSonera provides network access and telecommunication services in 20 markets in the Nordic and Baltic countries, the emerging markets of Eurasia, including Russia and Turkey, and in Spain. Operations are organized into three business areas: Mobility Services, Broadband Services and Eurasia. Business Services Finland –unit co-operates closely with Mobility Services and Broadband Services, but exists as a separate unit for business-to-business services in Finland and Sweden. In 2009, turnover of TeliaSonera group was 109 161 million SEK (approx. 11 738 MEUR), and net profit 21 280 million SEK (approx. 2 288 MEUR). TeliaSonera presents to be a World-class Service Company, which focus areas are to secure high quality in its networks and to create a best-in-class cost efficiency. TeliaSoneras shared values are; add value, show respect and make it happen.

Governance of Corporate Responsibility is integrated to the governance framework of TeliaSonera. Adhering to global principles and standards, TeliaSonera acts locally to address the relevant market risks, challenges and opportunities as part of our daily operations. In 2009, TeliaSonera took steps to re-emphasize its global commitment to corporate responsibility by introducing a group wide Code of Ethics and Conduct. TeliaSonera depends on the skills,

knowledge and experience of its employees to ensure continued success, and therefore puts a lot of effort into recruitment, employee training and competence development. Modern communication technology can offer environmentally sound alternatives in the day-to-day lives of people and companies. TeliaSonera strives to minimize the environmental impact of its own operations while helping customers by providing solutions to reduce their environmental impact. TeliaSonera recognises multiple customer- and technology trends. One of those is the need for more sustainable work patterns emerging through modern telecom.

“New technology provides opportunities to manage and operate companies more efficiently. Modern telecommunications contribute to reducing both long-distance travels, as well as commuting. Working out of the home is becoming more and more common. Reasons for wanting to work from home include less travel and more flexible hours.”

Sonera.fi

Thus, TeliaSora recognises the significance to be able to work outside of the office with secure access solutions, and that there are many ways to save energy through green IT solutions. Also, as mentioned in the previous chapter, employees are the key resource of TeliaSonera. It is important, that they are satisfied and work efficiently.

“Efficient and open communication culture is the basis for employee welfare.”

(Petri Niittymäki, SVP TeliaSonera Finland in TeliaSoneras publication for customers, 2010)

However, according to satisfaction survey conducted in whole TeliaSonera in the beginning of 2010, the satisfaction of employees on communication has been decreasing compared to previous years. It also comes up from the survey that there is a lack of training regarding technology solutions and communication. At the moment, it seems that there is no clear communication culture or instructions in organisation. It is important that organisation learns how to adopt and use new media in an efficient and organized manner.

4.2. Interests of Business Services Finland

Business Services Finland unit was in focus in this study. The need for further examination of communication and work practices originated from the management of Business Services Finland. The Business Services sales division is the TeliaSonera Group's common business sales unit. Business Services is responsible for marketing and sales of TeliaSonera's basic telecom services and managed service solutions to business customers. Business Services Finland serves variety of customers; large companies, small- and medium size companies as well as public sector. 220 employees work in the unit in Finland.

Services and products sold to business customers consist of variety of basic services like network connections and phone services, email servers and digital meeting services amongst others. However, customers are also provided with more complex solutions like unified communication -, integrated knowledge -, and telework services. Business Services Finland unit has high need for understanding the phenomenon of efficient communication media usage due to following characteristics:

- Business Services unit's business logic is in transformation from product-dominant to service-dominant logic. The organisation structure has only existed in the present form from the beginning of the year 2010.
- Even though the organisation structure in the unit is quite new, the average work years of employees in the organisation in general is high.
- Services sold to customers are complex in nature. It is very unlikely that one employee alone could solve the problem satisfying customer's needs. Thus, need for using networks and cooperating with colleagues in daily work is high.

The present situation is somewhat challenging. New organisation structure combined to high employee years and crucial need for efficient communication flow and usage of networks poses high need for efficient communication media usage. There is urgent need for new ways of working and developing individual's sales skills further to better understand customer's needs; exploiting the knowledge and skills of the unit as whole is essential.

Communication media has a possibility to change the current work practices and enhance the information flow as well as productivity. TeliaSonera is motivated to better understand this change, thus it is important to explore the phenomenon more deeply. At the moment, it seems that advantages desired from communication media usage are not in satisfactory level. As one of the experts, long term employee interviewed quoted:

“Internal communication in TeliaSonera is a total mess. There are no coordinated practices or media, and no one tries to think the big picture” (Expert interviewee, TeliaSonera)

Even though it is recognised, that with correct tools and communication practices better company performance might be achieved, there seems to be lack of unified communication culture and practises in TeliaSonera. Variety of tools is used parallel because there are no clear instructions. Communication seems inefficient and not very productive. Technologies are used in a manner, which they first were used when adopted, and new, possibly better ways of communicating and working have not been developed.

Thus, it is clear that there is room for improvements in Business Services communication practices. This thesis is part of the research conducted as co-operative project of three researchers aiming to understand the phenomenon. Purpose of the whole project was to understand the ongoing communication practices in organisation, new technology adoptions and their effect on organisations structures and processes. The emphasis of this particular study is on current communication practices of employees and challenges related to communication in knowledge-work.

It has to be noted here, that the issue is not only the concern of TeliaSonera, but also the one of the whole society. TeliaSonera recognises the need for change and wishes the insights gained from this study to be advantageous also in broader context. Thus, this case study is also part of broader project and publication³ aiming to raise discussion related to communication practices, productivity as well as competitive advantage the Finnish nation. TeliaSonera wants to be the leader amongst operators in understanding the issue.

³ Uuskasvua ymmärtämässä – kutsu kestävään tuottavuuteen, Gröönroos/ TeliaSonera Finland Oyj, 2010

5. Empirical Findings

The first step for analysing the factors influencing on employees communication media choices is to find out, what media is available in organisation. The list of communication media used in TeliaSonera is presented in the first part of this chapter. The actual media usage of the employees is then compared to the list of media available in theory. In the second part, factors influencing on employees' communication media choices are discussed and classified. Next, the problems occurring in organisation related to communication are examined. In addition, few example profiles of employees who communicate in a very different manner are presented to illustrate the phenomenon. In the final part of the chapter, supporting evidence collected from surveys is presented to elaborate the extent of the challenges found.

5.1. Communication Media in TeliaSonera Business Services Finland

Exploring the media employees use or don't use is the first step to gain insights of media choices; how do individual's experience the media? In this chapter, the communication media available in theory and in practice for TeliaSonera Business Services Finland employees is examined, and as a result the media included to this study is determined. In the second part, usage of this media by employees is examined mainly based on interview results, and supported by survey results. The usage is compared against the company instructions and policies based on documents.

5.1.1. Communication media available in organisation

It seems that there is a large variety of communication media available for TeliaSoneras employees. The relevancy of media for this study in Business Services Finland unit is defined with the aid of expert interviews and intranet survey, and the general information available in documents found from company intranet. Due to large variety of media, it would be too

complicated to take the whole variety into closer examination in this study, thus the list is limited to the most used media.

Data indicating the media usage in the Business Services unit level was collected from the internet survey regarding communication behaviour in organisation in July 2010. Questionnaire was sent to 220 employees, and gained 112 participants, response rate thus being 51%. Most of the questions were composed as statements with the response possibility at Likert Scale, from 1 to 5 (agree-disagree). Survey also included few open questions. Results are advantageous when examining the actual media usage rates in the Business Services Unit (figure 7) and thus give a good starting point for analysis for further analysis.

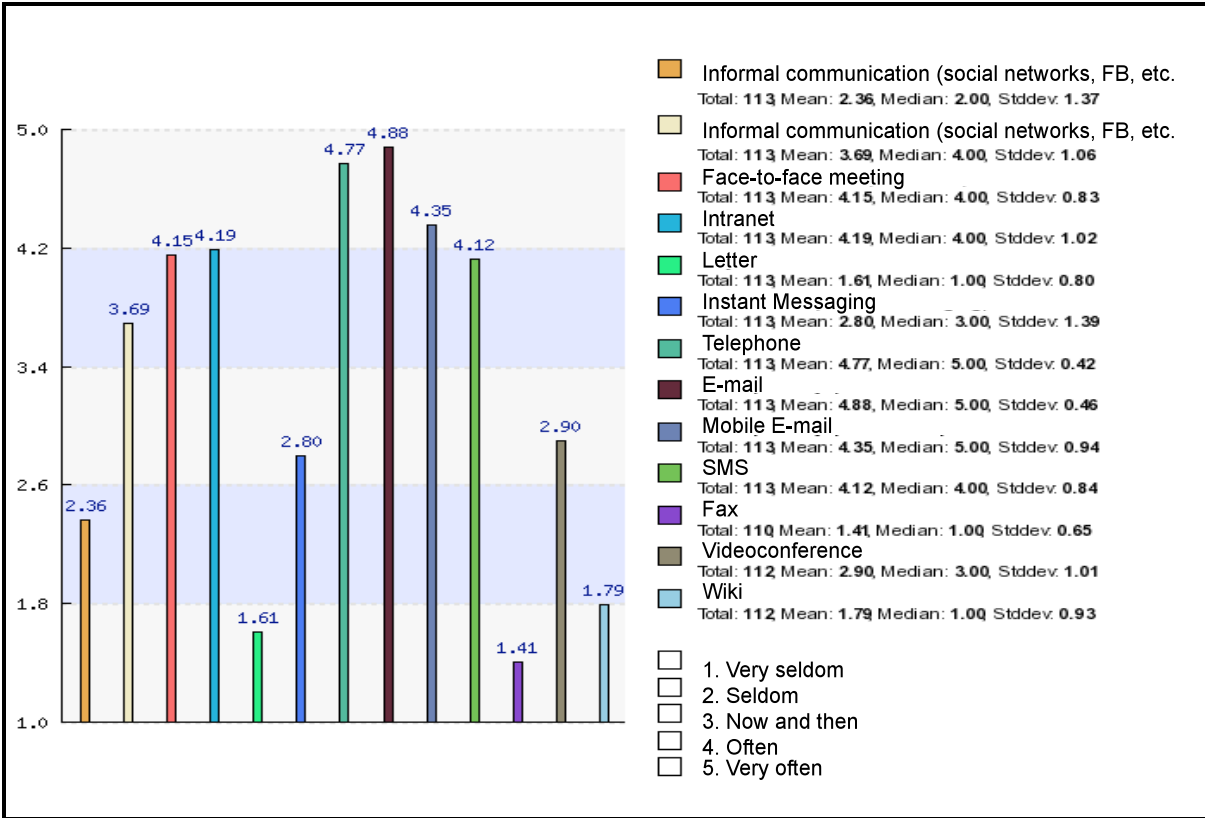


Figure 7. The means of media usage in Business Services Finland (Likert scale 1 (I use the media very seldom) to 5 (I use the media very often)

Intranet content was explored and analysed broadly. It seems that there is not one clear place where the media available would be listed, or instructions for communication and media usage, could be found. Bits and pieces were found under several different topics. To conclude, information of media tools is not easily available for employees.

Finally, expert interviews, intranet survey results as well as the instructions found from intranet were utilised together to gain a comprehensive understanding of the full media repertoire available in the organisation (table 5). The main criteria for including the media for closer examination, is the degree of usage within the Business Services Finland. Media with very low usage degree is eliminated. In addition; few media was not included to the original survey (figure 7), but seem to important part of everyday communication in the unit, thus they are included to the research.

List includes several different software, tools and channels, but only the ones which are commonly available, and at least in moderate usage in organisation, were included to full media repertoire list to make the results and analysis clearer. Based on this information, fax, letter/memo, RSS, Web and podcasts, Social media, Blogs and virtual communities and Microsoft OCS integrator were excluded from this study (see table 5). Document sharing and work support system would be excluded as well based on these criteria. However, during the interviews work support systems and document sharing seem to come up several times. Thus, they are included to full repertoire, because their exclusion based on expert interview, survey and intranet would not be appropriate; it might be possible that the usage would actually have been high if the researcher would have included these media usage levels in the survey.

Face-to-face interaction is not included to this media comparison; it is considered to belong to everyone's media repertoire. This comparisons target is to investigate digital communication media available. Though, face-to-face interaction is essential part of this research in general and thus included to final analysis. Consequently, full electronic media repertoire considered available for employees in this study includes 10 media. Results from the interviews are compared against this list: email, phone call, SMS, IM, Teleconference, Videoconference, Web conference, intranet, document sharing and work support system (see table 5).

Media	Expert interview	Questionnaire	Intranet	Relevancy in this study
Email	very high usage	very high usage	clear policies	included
Intranet	high usage	high usage	instructions	included
Tele Presence	very high usage	-	instructions	included
Video-conference	-	moderate usage	green policy encouraging	
Phonecalls	-	very high usage	mentioned	included
Net Meeting/ Webex: webconference	high usage		mentioned	included
Tele-conference	very high usage	-	green policy encouraging	included
Text messages	high usage	high usage	-	included
Face-to-face meetings	high/moderate usage	high usage	meeting services mentioned	included, but not to media repertoires list!
IM	not in formal use	moderate usage	mentioned	included
Wiki	low/moderate usage	low usage	mentioned	excluded
Social Media	not in formal use	low/moderate usage	-	excluded
Microsoft OCS	growing usage	-	mentioned	excluded
Document sharing			instructions	included
Work support system Tell U	-	mentioned in open feedback	mentioned	included
TeleMeeting	-	-	instructions	excluded
Fax	-	very low usage	mentioned	excluded
Letter/Memo	-	very low usage	-	excluded
RSS	moderate usage	-	-	excluded
Web-& Podcasts	low usage	-	-	excluded
Blogs	low usage, management level	-	-	excluded
Virtual communities (second life)	not in formal usage	-	-	excluded

Table 5. Communication media included to study: comparison of survey results, interviewee responds and intranet information and instructions

5.1.2. Usage rates, choices and problems related to media

Media repertoires of respondents were defined by dividing media to following categories; most used media, moderate usage media, low usage media and media not in use. This was based on the responds of interviewees (what media is available in organisation, what media you use most) as well as media mentioned related to other answers in the questionnaire. Judgement of active usage was made based on researcher’s judgement of the overall interview and media listed as most used.

Resp.	Most used media	Moderate use	Low use	Media not in use
0	email phone	intranet		IM
1	email phone	IM Teleconferencing SMS Document sharing		videoconference (used before, but stopped because of difficulties)
2	email phone IM	Teleconferencing Intranet Work support systems	Document sharing Videoconference (difficulties with bookings)	
3	email phone	SMS Work support systems Webconferencing Teleconferencing	IM Videoconference Intranet	
4	email phone SMS	Teleconferencing Webconferencing Videoconferencing Intranet Sharepoint		IM
5	email phone			SMS (deletes without reading) Webconferencing Intranet
6	email IM sharepoint webconferencing phone	intranet (good and bad sides) vdeoconferencing (trainings)		
7	email phone webconferencing	videoconference SMS	Intranet (hard to find anything) IM (so informal) Document sharing (critical mass)	
8	email work support systems teleconferencing phone IM		intranet document sharing (critical mass)	videoconferencing
9	email phone	intranet document sharing videoconferencing (trainings)	work support systems (slow, so he rather calls)	IM (he is too traditional)

Table 6. Media usage of interviewees classified to high, moderate and low usage

As can be seen from the table 6, majority of the respondents use mostly only two or three medium. The overall amount of media recognised to be available in the company varied between 4 and 9.

To take the analysis further, it seems that there is a difference between media repertoire perceived to be available in the company against the media repertoire, which is used actively. Both moderate and most used media is included to actively used media, because it is difficult to make clear distinction or definition of the degree of mostly used media and moderate usage. Interviewees are better comparable when these categories are combined.

Thus, repertoires are defined as follows:

Active media repertoire = most used media + moderate usage media

Perceived media repertoire = active media repertoire + low usage media + media not in use

Active and perceived media repertoire total numbers are marked to the table 6. At this stage, it is very important to note, that not even one respondent included all the media available in the company (10) to their repertoire.

Next, the media used by employees is examined more in detail based on intranet instructions, expert interview and interview results. The perceptions of the media, reasons to use it or not to use it are described. These insights further aid finding the underlying factors in media choices and usage.

5.1.2.1. Email

Email seems to be one of the most used communication media in TeliaSonera. According to expert's interview and survey, it is very common to use email also via mobile devices and outside of the workplace. TeliaSonera provides employees both of these possibilities.

"TS Mobile Mail is a push email service, which enables the user to receive emails, contact and calendar information to mobile device in real time." **Intranet instructions**

All the interviewed employees named email as most used media in organisation, and it was also included to everyone's actively used media repertoire. The expert interviewee describes email to be extremely common in use, there was also a mention of management pushing employees to use email, and it seems that it is almost a must for employees to use it. Problematic with emails is long contact lists, which increase the amount of received emails.

To minimize the capacity required by email on servers, automatic clean up is in usage at TeliaSonera. This means, that received emails are deleted automatically after 90 days, and sent mails after 30 days. Company guidelines also include the mention, that the purpose of email is not documenting and saving information. Though, it is possible to store information to different subfolders. Still, based on survey results (TS 2010), 16% of respondents mentioned need for documenting as the main reason for selecting email as a communication media. Email is commonly seen as a good tool for data archiving. Also interview results indicate the strong emphasis on documenting possibility when choosing email as a communication media. The following comments elaborate the phenomena:

"I would say that the amount of archived emails in my folders is approximately 20 000. I have different customers in different folders. It is a good way of archiving; I can then search for specific information by using outlook's finder."

Interviewee 3

"Email is good in proving things; there are no misunderstandings or room for mistake what was agreed on or said about the issue; everyone can read it from the email."

Interviewee 8

Employees interviewed struggle with large amount of emails every day. Email is experienced as a major factor increasing information load. Different techniques for inbox management have been developed amongst employees, for example organising carbon copy emails (cc's) to own folder and ignoring them and some are just trying to find the emails relevant for specific projects amongst other emails, and deal with the rest later. Employees also mention that unfortunately email is often used in decision-making processes, and problems oc-

cur. Few employees who were interviewed mentioned that it happens sometimes that a long conversation via email is conducted, but no resolve for the issue seems to be achieved. In some situations, it is a must to change from email into a richer channel, like phone.

Many interviewees admit turning the email program off or simply not checking it in few hours, when they need to concentrate on other tasks. Email is experienced as one of the source of constant interruptions. The result from survey conducted in TeliaSonera in July 2010 show that employees use 2 hours from their workday for processing emails. Also carbon copy problems seem to be largely present in organisation. Majority of the employees interviewed mentioned a problem with cc mails. They receive mails with no clue why it was sent to them, or what is message about. In addition, people don't seem to trust that enough other people use tools like document sharing, and thus use email.

5.1.2.2. Intranet

Intranet in TeliaSonera consists of several different areas: news, workroom, employee services and general information. In general information section, information regarding TeliaSonera organisation, projects and project management, measurements and reports, policies and governance, vision and strategy, branding as well as corporate responsibility is available for employees. Employee services includes useful information and tools regarding career development, meetings, vacation periods, invoices, and travelling, purchases, security and employee welfare. In the third area, workroom, work related tools for business are provided, but it also includes for example news and menus for restaurants.

In short, business related information and policies are available in general information section, practical advises and tools in employee services and workroom sections. Though, it is not always obvious which section includes what information. In the news section, current news regarding TeliaSonera are provided, most of the information is announced when it comes available for general public. As overall, page seems to be more built for internal promotion and image/culture building purposes.

According to expert interviewed, Intranet in TeliaSonera is like an enormous pool of knowledge, though there is way too much old and irrelevant information. Easiness of usage is at low level, and it is expected that hardly anyone uses it. As interviewee quoted:

“The most efficient way to secure information is downloading it to Intranet – no one is ever going to find it”

(Expert interviewee, TeliaSonera)

Intranet is used at moderate level according to survey (TS2010). Amongst the employees interviewed, the opinion seems to be that intranet is used at TeliaSonera in some degree, but it is not experienced as efficient. Information is hard to find and functionality is not logical. Five out of ten employees interviewed use intranet at the moderate level, no one uses it as “most used media”. In addition, three employees use it at the low level and one perceives it as available in organisation, but is not using it. It seems that intranet is experiences useful in finding some information, but usually personal networks are rather used instead. One interviewed employee experiences intranet as a necessity; it is about creating the common corporate culture.

5.1.2.3. Tele Presence & Video Conferencing

According to information available in the intranet, there are two videoconferencing systems in usage at TeliaSonera; TelePresence and Videoconference. TelePresence conferencing service enables a conference with 30 participants around one virtual table so that in reality there are 6 participants sitting in five separate meeting rooms. TelePresence conferences can be arranged between five rooms in TeliaSonera. The videoconference equipment enables conferences between 2-8 locations at the same time. The primary reason for videoconferencing usage seems to be to reduce travelling and thereby save the environment as well as enable more efficient use of time when the time formerly used for travelling can be used for working. It is also mentioned in the intranet, that videoconference services could and should be used more.

“The use of videoconference and TelePresence conference services has raised along the number of locations has increased. However, the systems are not fully utilized and there is plenty of room to increase the usage. Only 32 % of the respondents declared to have used the services occasionally (30 % in 2008) and up to 52 % have no experience what so ever of the services. However, there is a significant raise as 70 % of the respondents had not used the services in 2008.” **(IT user satisfaction survey 2010)**

According to TS2010 background survey, videoconferencing is in moderate usage in Business Services Finland unit. Amongst employees interviewed only four uses videoconference actively (high or moderate level). Two out of these four use it especially for training purposes. One employee would like to use videoconferencing, but claims that it is not available in organisation. Four employees either use videoconference only sometimes, or not at all, but perceived it to be available. Reasons for low usage are bad past experiences (connection did not work), small amount of videoconference rooms (difficulties in booking) or that it does not give much extra value in addition to phone calls (one respondent claimed this). Difficulties with the system resulted in rejecting the usage of videoconferencing in the case of one employee. Most of the respondents seem to have somewhat positive attitude towards videoconferencing, and they think that in some cases it can replace face-to-face interaction. Sometimes videoconference is also used amongst employees interviewed because it is a must – for example when the long distance between the communication partners limits the options.

“Face-to-face communication is the only way to establish relationships” **Interviewee 5**

5.1.2.4. Phone calls and Tele Conference

Teleconferencing is a very popular medium according to expert interviewee, and a standard routine in the board meetings. Most of the advantage is gained in information sharing and routine meetings. Phone is the most used medium after email within the business unit at hand in TeliaSonera (TS2010). Ten employees interviewed mention phone to be the most

and actively used media, in addition to email. Thus, it is discovered from everyone's active media repertoire.

Teleconference is slightly less used; it can be found from five people's active repertoire, but mostly on moderate level of usage. No one mentions teleconferencing to be not in use or at low level, which indicates that everyone might use it, but perceive it as part of phone use /similar to phone calls, and thus don't mention it as a separate communication channel.

Phone is perceived as a good medium, when things get too complicated to be dealt with via email. Couple of interviewed employees elaborate, "sometimes the conversation just doesn't lead to any resolution, and the phone call has to be done to clarify things". Some employees tend to use email instead of phone, because phone call can't be documented. One employee especially seems worried that the content of conversation can't be proved afterwards, which might indicate low trust in organisation. Perceptions of availability of the partner seem also to limit phone usage. Quotes from employees interviewed like "some people never answer the phone" highlight this perception. It is also common, that instead of phone call email is sent first, either because of the desire not to distract the respondent or to book a time for the phone call due to low expectation of availability. In general, phone is experienced as fast medium, and it is sometimes used to shortcut the formal processes like work support systems.

5.1.2.5. Text Messaging

It came up during the expert interview, that text messaging is used a lot in TeliaSonera. It is also used as a parallel communication medium during face-to-face meetings; it is common that employees sitting in the meeting message each other even in the same room. According to survey (TS2010) Text messaging is in high usage, the usage level is the same than with face-to-face meetings and intranet. However, only four out of ten interviewed employees actively uses SMS (moderate or most used). In addition, one employee perceives SMS to be available, but deletes them without reading them. It is also possible that some of the employees forgot to mention SMS because they perceive it to be a part of phone usage.

SMS is perceived to be speedy medium and good for conducting small checks. Longer issues are then dealt with via email. Few people experience SMS as good medium, which ensures that message goes through. On the other hand, some people don't even use SMS. The contrast can be seen from the following statements;

"People read sms during the meetings, which is the culture. That is why sms always reaches the receiver." Interviewee 1

"I delete SMS' once a week without reading them, I don't have time." Interviewee 5

To conclude, SMS seems to be preferred for small and urgent issues, like checks or notifications. Respondents seem to use SMS because of good expected availability of the receiver.

5.1.2.6. Instant Messaging

Instant Messaging (IM) was planned to be integrates into Teliasonera formal communication tools, but the security risks were too big at the time, explains trainer interviewed. Thus, system was only integrated for internal usage, though now it seems like no one uses it. Trainer interviewee describes the common situation and application useless, though admits that some of the teams might be able to take advantage of it. Intranet does not provide specified information about Instant Messaging options for employees provided by the company.

According to survey (TS2010) IM is in moderate usage in Business Services Finland, at the approximately same level than videoconferencing. At the moment, only four of the employees interviewed use IM actively or at the moderate level. Active users see it as important tool in team communication, and experienced it efficient especially for ad hoc questions. Very few interviewed employees understand the possibility to save conversation history with IM. During the interviews, couple of respondents mentioned IM to be very informal, and they do not use it for work related communication. Few of respondents do not even perceive IM to be available in organisation

“Partner influences on my media choices, I use a lot of messenger with some people, and the language is then very slang-like. Emails are more formal.”

Interviewee 2

Reasons for not to use IM, are perception of high degree of informality and the lack of information about other possible users, amongst others. Few respondents know that some colleagues are using it, but they just have not started to use it themselves, either they consider themselves too traditional, or there are some other barriers. Attitudes towards IM are somewhat positive.

5.1.2.7. Web conference

Webconference is used as a term for NetMeeting and Webex, which manufacturer-related terms (Microsoft). As described in the intranet, NetMeeting should be used when having conferences between TeliaSonera employees (internal meetings). WebEx should only be used when there are external participants in the meeting. Interviewee mentions that NetMeeting is a very common tool within the company; it is used for example for internal training purposes.

On the contrary, only four of the interviewed employees use web conference actively (high or moderate level). In addition, one perceived web conference to be available in organisation, but does not use it at all. The level of net meeting usage amongst interviewees seems to be on a same level than instant messaging usage, though; only one of the respondents uses both. One interviewed employee finds web conference especially handy in training sessions.

5.1.2.8. Document Sharing

In Business Services Finland unit, Sharepoint and Team room are the group support system tools used mainly for document sharing. In this study, document sharing is used as a term for all team room and share point activities described by interviewees. As instructed in company's intranet, TeliaSonera's Team room provides web-based tools for supporting own work and knowledge management, as well as for project management and group work. The

service is based on Microsoft's SharePoint technology. Instructions encourage employees to use team room for document sharing, archiving and cooperation. The site provides possibilities for individual and team based usage with variety of different levels of access rights. The advantage is access to up-to-date material centralized in one place. According to intranet, usage should reduce email attachments.

Seven out of ten of the interviewed employees are using document sharing at some level, and four have included it to active media repertoire (most used or moderately used medium). Though, only one lists it as most used media, so it can be expected that the usage level in general is not very high. Employees understand the advantages of document sharing, but it seems to be very common that it is not used because they don't know if enough other people use it. There seems to be assumption, that there are not enough other users. In project-based teams, it is very common to establish document sharing group or folder, which is then quite actively used.

"We have the archive, but I don't know if anyone visits it"

Interviewee 8

Few people experience the management of folder, like granting access rights, so complicated, that there is no use to use document sharing in all the work tasks. One employee interviewed mentioned the advantage of document sharing to be the easily accessible information, which is possible to review according to timeline and history. The responsibilities of persons involved are clear, and the latest information is always available. Few users tell the advantage of document sharing to be minimizing attachments sent via email, though they then remember that they usually can't be sure if everyone then visits document-sharing folder.

5.2.1.9. Work support systems

Tell U, the work support system used in Business Services Finland is business process management software, which supports sales and account management processes. Tellu software used in TeliaSonera is IBM Lombart Teamworks, which is one of the leading business

process management tools. As intranet describes, the advantage is better control and visibility for customer based information when the workers dealing with project produce information for common usage. The support requests from sales to support personnel are channelled through Tell U, which enables better knowledge management – the issue is sent to right person, who really knows about it. Tell U's processes can be described as a chain; sales strategy planning, prospect analysis, offer preparation, sales negotiation and finally resulting contract. According to intranet, Tell U is not CRM software, but it acts as an intermediate between people and different applications replacing a bunch of formerly used tools. Even though Tell U is not traditionally seen as a communication tool or channel, it seems to be essential in enabling Business Services -units daily communication flow, especially due to complexity of services sold and the high demand for co-operation amongst co-workers.

Based on the interviews, work support systems are used in organisation, especially by employees who are in direct contact with customer, or support customer responsible personnel. Few employees have recognised that usage of work support system may minimize the email load. One employee mentions the downside of support systems to be slow speed; the phone is quicker, which is often used instead of formal work support system to speed up the work task. The employee interviewed, who receives work requests via work support system, also mentions that customer responsible persons are trying to shortcut the formal system and trying to get their own requests first in line. Person working on this side finds it stressful and annoying.

Thus, it seems that work support systems have possibility to decrease the email load, but it is often shortcut by the person who makes the request by making a phone call. This is again experienced stressful by the person who should receive the task via support system. The speed (or slowness) seems to be preventing the usage.

5.2. Factors influencing on media choices in knowledge-work

Based on the discussion related to each individual media in organisation as well as other factors that came up during the interviews, the factors influencing on media choices are examined as guided by the conceptual framework. Empirical data is classified and categorized loosely according to the framework, but also includes new factors. The factors found seem to have variety of different types and strengths of influence based on the interviews conducted.

5.2.1. Active and perceived media repertoires

Based on the discussion related to usage of the different media, it can be concluded that media repertoires, both perceived and active repertoires, has significant impact on individual's media choices. As described earlier, active repertoire refers to the media actively considered when choosing media. Perceived repertoire in its behalf refers to the range of media, which employee experiences to be available in organisation. There is a big difference between the media available in organisation versus the media actually used by employees. There is also a variety of perceptions of which media is available in organisation, in employees opinion.

"In practice, only media we have available is phone, email and mouth" Interviewee 5

Even though media capabilities and characteristics are understood well, media is not used if it has not been perceived available, or, most importantly, if it is not included to actively used media repertoire. Organisation has strong connection to employee's media repertoires; it looks like TeliaSonera has failed to communicate available media to employees, because not even single interviewee listed all the media, which in reality is available. Most of the respondents has mid-range repertoire, but active repertoires varied a lot. Email, which is the most popular medium, was found from everyone's active repertoire. All the interviewed

employees do not actively use new tools, like IM or videoconference, and some of them don't even perceive them to be available.

Based on empirical evidence, media repertoire together with organisations influence maybe considered one of the major factors influencing on employees media choices. If media is not actively used, it is not actively considered when choosing media for task either. Factors like situation or availability are applicable as choice criteria only after media is in active use.

5.2.2. Theoretical Media Capabilities and Communication Process Efficiency

Based on the interviews, it seems that media capabilities have some impact on media choice and they are understood well. However, the influence does not seem to be very strong. Capabilities were also misused in some degree, like in the case of email (documenting). Intranet instructions and the opinions of employees are highly different from each other. All the respondents understand media capabilities and features in a very similar way. (Perceptions are well in line with Media Synchronicity theory's media-task descriptions). People acknowledge, that decision-making processes should not be conducted via email, however many respondents admit that unfortunately often it happens. Respondent recognise the features and capabilities of synchronized and asynchronized media and the importance of synchronized media in interaction and relationship creation extremely well.

"Instant messaging it good when teleworking, and have to ask something quickly from colleague"

Interviewee 8

"When I communicate with colleagues early in the morning, I send an email because I don't want to distract or wake them up."

Interviewee 0

In terms of complex information sharing, there seems to be some misunderstandings and differing preferences, though this might occur because people learn new in a very different ways (e.g. visual, verbal...) People recognise the features and capabilities in a clear con-

tinuum, e.g. face2face provides best possibilities for interaction and multiple cues, and in some cases it can be replaced with video-conferencing and in next case with phone. They also recognise the speed and reprocessability possibilities of media well (email good for reprocessability and sms quick) Perceptions as email as a great tool for documenting seems somewhat overly emphasized.

5.2.3. Appropriation factors and personal factors

Individual background and IT skills and training seem to have some influence on choices. IT skills may influence mainly through perceived media repertoires; low skills might limit perceived media repertoire and thus limit choices only to few medium. On the contrary, employees with high IT skills seem to perceive the repertoire available as wide, even though would not be actively using it.

It seems that few people, who have had some training in organisation related to media usage, have widest media repertoire, both actively used and the media assumed to be available in organisation. Thus, training seems to have some influence directly on the active media repertoire. In general, very few people in organisation have received any kind of training. The most common type of statement regarding training for communication media seems to be: "There might have been some training offered, but I have never been participating." Interesting is that this has been stated by several interviewees almost as identical sentence structure.

Old developed usage habits seem to influence on the adoption and usage of new systems, and negative past experiences may hinder the adoption and usage of new tools. Thus, they may have direct influence on active media repertoires. There have been somewhat unsuccessful media/software adoptions in organisation during the recent years, and several respondents have mentioned their attitude towards new technologies to be positive, but they admit being sceptical towards adoptions because of past experiences. These past experiences might have influence on why certain media is not adopted to active media repertoires, even though it would be available in organisation. Several respondents have elabo-

rated that adoption could be more efficient, if advantages were understood and training/clear instructions provided. Training has been experienced too technically orientated.

“I don’t feel anxiety when adopting new tools, but if it does not provide me with advantages, I am not using it then”

Interviewee 3

“Our trainings are too technical or generic, the target audience and purpose should be better considered.”

Interviewee 1

5.2.4. Organisations influence

Organisation’s influence on individual’s media choices and communication behaviour seems to be very strong. Organisation’s communication culture has high impact on individual’s choices, even though it is not articulated but more so tacit knowledge and habits, which are developed over time. As mentioned in earlier chapter regarding media repertoires, it seems that organisation has not communicated the media available clearly enough; thus people don’t understand the options available. Thus the media perceived available has mainly developed through uncontrolled communication culture and social influences. Every respondent named email as the most used and popular medium in the organisation, which gives signals of existing, common habits. Especially in the case of new employee, organisation’s influence seems strong. Organisation culture and social influence are tightly connected to each other, and can’t be clearly classified into different categories. Perceptions of the popularity of medium in organisation accelerate usage of certain mediums like email. It seems that there are doubts existing regarding the usage level of document sharing.

“Internally, I send emails, to customers I call. This is more so learned habit, I do it because others do even though another way would be more comfortable for me.”

Interviewee 0

5.2.5. Location and usability of media

Location as well as usability of media seems to influence on media choices. Location has a minor influence on available media repertoire, but usually not directly on choices. Respondents in general think, that location has no influence on their choices. The only mentioned factor is that they don't have possibility to use video-conferencing, when working at home. This factor is connected to location, but it has more to do with media repertoire; limited media repertoire is the factor influencing on the decision not to use video-conferencing, because it simply is not available.

Location may have influence on the repertoire available also by other route; when working in an open office, people have possibility to use more face-to-face contact and ad hoc questions. Distance between the communication partners may force them to use videoconference, and in this case location is again influencing on choice via media repertoire available. Location of the partner is not perceived as an active choice factor.

Usability, or convenience of medium, influences on media choices. It has a big impact on choices, how easy the media is perceived in terms of usage. Own convenience seems to guide decisions of many interviewees, especially in an environment where information overload and interruptions exists.

"Phone is the number one media for me, writing emails takes effort so it is easier to just make a phone call"

Interviewee 9

Often it seems to happen that perceptions of low usability or difficulties in using the system hinder the usage and adoption of medium. This has happened especially with new media like videoconferencing or integrative services. Some interviewees have experienced that there is too few videoconferencing rooms available, and it is difficult to book them.

5.2.6. Situational and task related factors

Situational factors are only considered, after other factors set the frame for possible media selection. Some respondents, who had very narrow media repertoire and no training or extensive IT skills, might never reach this level. Their choices are so limited at the earlier steps like media repertoires and personal factors, that situational factors have only minimal effect. Interviewees who recognised the importance of efficient communication and the importance, or better said lack of common media usage habits had better possibilities to include situational factors to their decision process. These employees had wide media repertoires, which give them more media to choose from based on situational incentives or constraints. Thus, this factor category can be considered as a final media choice influencer.

5.2.6.1. Partners behaviour, availability and familiarity

Partner influences on choices with most people; partner's familiarity makes it possible to use leaner media, but almost all the respondents see face2face interaction as a must when establishing relationship. If partners' communication behaviour (learned over time) is known, it influences on media choices. Especially the expectation of availability seems to be important. What is interesting is that people see availability more so as a static feature of the partner, not as a temporary status. Hardly anyone checks availability for example from IM's status updates (though, this might be related to low usage rate if IM). Thus, availability is seen as a static state. In general, many of the respondents have mentioned the difficulty with phone contacts, partner is often too busy to answer or talk and that is why asynchronous media is sometimes preferred.

9 out of 10 interviewees see availability as learned behaviour patterns, and consider it when choosing media "he never answers the phone". Only situation, where availability is influential on choice directly as a dynamic feature, is when sitting at open office and visual contact to person exists. If the person is talking on a phone, asynchronous media like email is used.

5.2.6.2. Task type, familiarity and urgency

Urgency seems to influence on media choices. Most of the interviewed employees included urgency of the task to their active choice criteria. Urgency in some cases hinders the usage of work support systems (perceived as slow) and emphasises the usage of speedy medium like phone. Few interviewees also mention urgency alters their decision making processes;

“When busy, I choose the medium intuitively. I don’t think.”

Interviewee 6

Task has some impact on media choices. Part of employees included task into their choice criteria. . Even though many respondents did not name the task at hand as influential factor in their media choices, task is often regarded at least in some degree. It seems that even though task and their appropriately to certain media usage is acknowledged as stated in the chapter dealing with understanding of media capabilities, often other factors like urgency and organisations communication culture overwrites the rational task perceptions.

5.2.6.3. Incoming medium

Incoming channel influences on choices; it seems very common, that people continue the same channel, where they received the message. Channel is changed only, if issue then seems too complex or urgent to deal with in a certain channel, which then happens as upgrading (from email to phone call or face-to-face). Downgrading of the channel seems not to be done often (from phone call to email).

5.3. Challenges in organizational communication

Several problems experienced by employees came up during the interviews. These challenges are partly supported by the data collected in the surveys. Challenges are here divided to different categories to clarify the problems.

5.3.1. Difficulties in coping with information overload and media

Six out of ten interviewed employees experienced, that they don't have possibilities to get to know all the information they need. According to the intranet survey, 71 % of the employees of TeliaSonera experiences, that they have no time/possibility to get to know the information they receive during the workday.

5.3.1.1. Filtering relevant information and email dominance

The amount of emails seems to be unbearable, 80 % of the TeliaSonera employees who responded the survey receive over 25 emails per day. (17% receives even more than 51 emails per day.) Similar problems occurred also during the interviews.

"I use 6 hours per day dealing with emails. I also check emails at home in the evening to ease the next morning at work, even though my family experience it distracting. I try to get the amount of emails in inbox below 50 when I finish my day, otherwise it generates stress."

Interviewee 3

Most of the interviewees tend to think that email is used too much in organisation. When receiving such numbers of emails, people encounter problems in managing their email traffic and inbox. Filtering relevant information is experienced as challenging. Interviewees tend to seek the relevant emails from their inbox, and concentrate on the rest later.

"I have no time to go through all information; I try to filter the information I really need. Of course, sometimes relevant information is missed"

Interviewee 2

Some of the employees filter emails even more roughly; all the cc' emails go straight into own folder, and they are necessarily ever read. Problems occur when practices don't match and people send important issues as cc email. Email seems to be a major cause for information overload. Few employees recognise the positive influence of instant messaging and work support systems. It is experienced, that with the aid of these new tools the email load can be decreased. On the other hand, few employees recognise email as problematic, but can't see any options for it. The extreme case is that few employees perceive that email is used accordingly in organisation.

The habit of using email has been emerging without any control, and many employees miss commonly established practices. On the other hand some of the new media is experienced challenging; for example earlier difficulties with videoconferencing pose restrictions for future usage. New media adoptions and implementations are also experienced time consuming.

5.3.1.2. Low trust and unclear responsibilities

There seems to be somewhat negative attitudes towards management in lower level of organisation, which indicates low level of trust. Few of the interviewed employees experienced, that people send a lot of cc emails in hope that some one would react to them. One interviewee highlights the problem of unclear authorities and responsibilities as follows;

“People should be told their job descriptions – everyone has responsibilities but no authority. People avoid making decisions, which is why question is sent to 100 people via mail in hope that some one would take responsibility. Usually no one does, and then the customer gets anxious.”

Interviewee 5

Email usage tends to be emphasized also in situations, where changes in organisation structures emerge and some people are possibly fired, trying to demonstrate that they are valuable for organisation. Supervisors are included to email chains in these kinds of situations in wrong reasons. The issue of using cc' field in a wrong manner problems at many levels. Important information can be missed because emails are poorly targeted.

5.3.2. High level of interruptions and difficulties in concentration on task

As mentioned in the previous chapters, it is very common that people try to use email for all types of communication. Other tools like document sharing and instant messaging are not used extensively. Phone calls are made even though the person sits just around the corner. It is common that synchronised media like face-to-face communication is seen as the only way for truly efficient communication. It is agreed amongst interviewees, that personal contact is essential when creating relationships. Advantages of alternative media are not fully recognised. Thus, people usually choose the most interactive media available, which is usually walking to the colleague's desk or talking in the open office.

This on the other hand leads into high level of interruptions experienced in open office environment. Almost all the interviewees experience, that it is impossible to do any task which require concentration at the office; they rather work at home. In extreme case even team manager has encouraged team members to go and work at home, if they need to do something what requires concentration.

"Interruptions are constant and distracting"

Interviewee 8

Some employees interviewed experienced that IM status usage would help (available/busy) so that wouldn't have to distract everyone when searching for available colleague when needing information

It is common, that multiple media used for same task. Unrealistic email response time expectation increase the amount of communicative acts; if the response to email does not arrive quickly enough, a phone call is easily made to speed up things. Employees are conducting several work tasks during the day, and sometimes it is hard to return back to task after doing something else. In general, multitasking is experienced normal and not distracting in bigger scale

5.3.3. Challenges related to knowledge flow and management

Interviewees have complained that people don't read the emails properly. It does not matter, if materials are sent before the meeting, no one still reads them. Thus, knowledge is not managed very efficiently in organisation.

"It does not matter what kind of a message you write, people don't read it anyway. As an example; there once was a training session with buffet. Everyone ate before the event because they did not know that food was available – even though it was clearly stated in the invitation. People just flick messages through, looking at the like the heading and topic (training, I've been in these before, this is for me) and then press accept.... This tells a lot of our communication culture."

Interviewee 2

5.3.3.1. Low efficiency of formal systems and availability issues related to personal networks

It has been noticed, that lot of time is wasted in searching for information. Intranet is experienced inefficient, and people tend to use personal email for archiving.

"I would say that the amount of archived emails in my folders is approximately 20 000. I have different customers in different folders. It is a good way of archiving; I can then search for specific information by using outlook's finder."

Interviewee 3

Almost all the interviewees mention personal networks to be the most important channel in information search. Most of the employees have worked in TeliaSonera for a long time, and have established contacts. However, the employee who has only recently started in the organisation encounters difficulties in finding information. It is hard to know who to ask from. Usually the information has to be received from a person instead of formal systems, because of personal email archives. In addition, formal work support systems are experienced as slow and often shortcut by making a phone call.

High usage of personal networks is related to availability problems. When a specific person is not available, delays occur in conducting tasks. People tend to use different techniques to cope with the information overload, for example turning the email off for hours when concentrating on other tasks. When all the employees have different habits, it is impossible to know how to reach who and when. The following comments elaborate the problem;

“To know how to reach a person, communication habits and most used media should be known”

Interviewee 7

“People don’t respond and I can’t proceed with tasks. It generates stress.”

Interviewee 1

5.3.3.2. Matrix organisation and lack of common tools

In general, employees are longing for unified communication culture and common practices. The habits have emerged over time, and people have their own ways of communicating. When co-operating with necessary subsidiaries and other business units, there is always not even common tools for communicating; except email and phone naturally. A lot of work is done in project-based teams. For example it is hard to know who uses instant messaging, who has videoconferencing etc. In extreme cases, it has happened that employees haven’t been able to even acquire the phone numbers of the co-workers they need, because they belonged to different business entity, a subsidiary. Unified culture has been the wish of many employees;

“It would be good to establish common practices how to communicate.”

Interviewee 2

5.4. Example profiles

When comparing results from the different interviews, there seem to be few different types of employees in terms of their communication habits. The distinctive types presented to illustrate the polarized communication behaviour in TeliaSonera are described in table 7.

	Type 1 Advanced communicators	Type 2 Traditional comfort seekers	Type 3 New employee under organisations influence
Choice orientation	Orientated to task and several factors when choosing media	Orientated to easiness of usage and own convenience	Receivers preferences influence if known Organisational habits have big influence on communication behaviour
Media repertoires	Active media repertoire more than five	Active media repertoire less than five	Active media repertoire less than five
IT skills, training and attitudes	Basic to high level IT skills, even training received	Average IT skills, no training received	Good IT skills an positive attitudes

Table 7. Different communicator types in TeliaSonera Business Services Finland

The full analysis and type tables can be found as an appendix (appendix 3). Factors compared were communication media repertoires, main orientation when choosing media, IT skills, and training received, attitudes and partners influence on media choices. Also the job description was included in terms of daily customer contact. Interruptions and their degree of distraction as well as problems experienced are also examined in terms of relevant parts. The comparison table of these factors can be found as an appendix (appendix 4).

Likelihood of continuing the same channel seems not to have anything in common with division of groups; it varies across the groups and within them. Problems in organisational communication also seem pretty similar. Physical work setting is pretty much the same amongst all the respondents, except with one: respondent 9 has own office, and belongs to the group 2. Location does not seem to influence on choices much.

All groups perceive media/tools capabilities in a similar way; it does not seem to influence on choice much. Even though the employees interviewed know which tool is good for which task, they don't use them accordingly. Every interviewee has mentioned that dominating communication tool/channel in organisation is email, and email can be found from everyone's active media repertoire. Thus, it seems that organisations communication practices/culture has strong influence on employee's media choices, even though common instructions are not articulated, but more so developed over time as tacit knowledge. Especially new employee, worked in the organisation under one year, is highly influenced by colleagues' communication practices and media choices. She uses channels what others use, and has learned these ways from colleagues. High IT skills and no training seem to emerge together with narrow media repertoires and orientation to own convenience and urgency in media choices.

It seems that evidence from surveys conducted in TeliaSonera and hundreds of small and medium sized companies somewhat support these results. When open questions were analysed, four groups were found; *own convenience -orientated*, *situation-orientated*, *task-media -orientated* and *receiver-orientated* employees. This survey-based data and results are going to be presented in the next chapter.

5.5. Supporting evidence

Survey results from the one conducted within TeliaSonera Business Services organisation, as well as the one conducted amongst Small- and medium size Finnish companies support the qualitative data findings. Factors influencing on media choice was explored both in TeliaSonera survey and Small- and medium size company survey. The challenges related to communication were investigated only in TeliaSonera questionnaire. Findings support the challenges found during interviews, as well as the different types of communicators found amongst employees. Results also highlight the possible low trust in TeliaSonera.

5.5.1. Communication media choice criteria

Findings from open questions from both questionnaires support the two extreme types of communicators found during the interview process; advanced communicators and traditional comfort seekers. One end of the continuum seems to be “selfish motives” whereas in the other end several factors are actively considered. Thus, the facts that people choose media based on own convenience seems to be a common problem also outside this organisation. Results from open questions in TeliaSonera also support the issue of low trust, which came up during the interview process. Need to documentation seem to be disproportionally highlighted in TeliaSonera, when considering the criteria for media choices. In the other organisations, need to document is much lower.

One of the open questions in the survey asked employees to describe how they choose a communication tool for certain task. Questionnaire was sent to 220 employees in TeliaSonera, and 69 answers were gathered for the question, response rate being 31%. To support the result, the similar analysis was conducted to the results from Small and medium size company -survey; 331 answers were gathered, which was 49% of the finished answers to the whole survey.

The results indicate that most decisions are somewhat irrational, which supports including situational and other conditions into theory framework. The respondents were categorized into four groups based on coding of the short answers. Coding was conducted by two separate researchers, which increases the reliability of the findings. First, the most common criteria for media selection were gathered (see table 8).

Criteria	TS	SMEs
Speed (saving time, efficiency, urgency of task)	31	96
Need to document (Black on white, leaves a trace)	11	15
Medium characteristics (easiness, usability, functionality, flexibility, stability)	19	129
Task and situation (not urgency; content, complexity and importance)	19	168
Receiver (familiarity, skills, amount, availability)	24	62
Own motives (stress, own habits, locations, past experience and feeling)	14	38

Table 8. Choice Criteria counted from TS and SME surveys

Speed was mentioned most often at TS (31). Task and situation was mentioned most often at Small and medium size companies (168). The main factors influencing on media choice were very similar in both surveys. Speed and situational factors are in top three in both surveys. Interesting is, that when the numbers of different criteria are compared to most used criterion, documentation seems to be on much higher level on TeliaSonera than at Small and Medium size companies. (11 vs 31 in TS, 15 vs 168 in SMEs). The high need for documentation might be an indicator of low trust and unclear responsibilities. In addition, six respondents in SMEs mentioned the current practices as a criterion, whereas in TeliaSonera no one mentioned them.

In the choice criteria presented above, the principle was that one respondent mentioned multiple different criteria. At the next step of analysis, based on factors presented above, similarities and often-repeated factor combinations were searched amongst respondents. Based on them four main profiles were formed by combining the similar type of responses (see table 9). The profiles were aimed to be formed in a way that profile would consist of persons who clearly orientate strongly on one factor. The rationality (task-media efficiency) in choice is growing along every new group; in the first choice is only based on own motives,

whereas in the last, fourth group the media, situation and also receivers understanding are considered. Media Synchronicity theory was used as guiding principle when forming profiles.

Receiver-orientated group	Media-task orientated group	Situation orientated group	Own motives orientated group
<p>This group clearly considers which is the best medium to deliver the message, so that receiver would understand it clearly and have an appropriate interaction with sender.</p> <p>Task- and media characteristics are considered as well as situational factors, but the group clearly demonstrates the advanced understanding of the importance of processing abilities of the sender in relation to task and media.</p>	<p>Important criteria are the perceived usefulness of the media in delivering particular message.</p> <p>The characteristics of the media are well recognised. This group also includes some situational factors as selection criteria, but emphasis is clearly more on media-task fit</p>	<p>Situational conditions have a strong influence on decision making; urgency of the task, availability of respondent etc.</p> <p>Characteristics of the media are included in some degree, like the perceived speed of the media as communication tool, but not considered to be the essential criteria.</p>	<p>The choice is made based on own experiences and perceptions.</p> <p>Habits are important, no other criteria is included when selecting media</p>

Table 9. Different types of communicators at TeliaSonera Business Services Finland: survey results

In addition, a small group of respondents falls in between the categories and doesn't profile clearly in any of them. The amount of employees choosing media based on own motives like convenience as well as the ones who are oriented to situational constraints is alarmingly high. It seems that not many people choose media by maximizing the efficiency. The results from Small and medium –size companies indicate similar situation (table 10), even though the sample size is much larger. Thus, it is possible that problem might be largely present also in other companies. Though, this analysis does not provide specific understanding of the respondents' media choices, because the data and analysis is constructed on the basis of short open questionnaires in the internet survey. The sample size is also relatively small in the open question, which raises the question if non-sampling error emerging; would the respondents who did not fill in the answer respond differently from the ones that did respond. However, the result supports the different communicator types found based on the interviews.

	Receiver	Media-task	Situation	Own motives
SME	12	75	92	54
SME %	3,6 %	22,7 %	27,8 %	16,3 %
TS	5	16	18	10
TS %	7,2 %	23,2 %	26,1 %	14,5 %

Table 10 The amount of respondents: different media choice orientation profiles in TS and SME survey

5.5.2. Challenges in Business Services Finland

When looking into the average workday at TeliaSonera Business Services based on survey results (TS2010), meetings seem to take two hours. As can be noticed from the graph below (figure 8) the number of received emails is higher than the number of sent ones. This may result from high number of carbon copies (CC's) and confirmation emails. It is possible, that the amount is high due to low level of trust in organisation

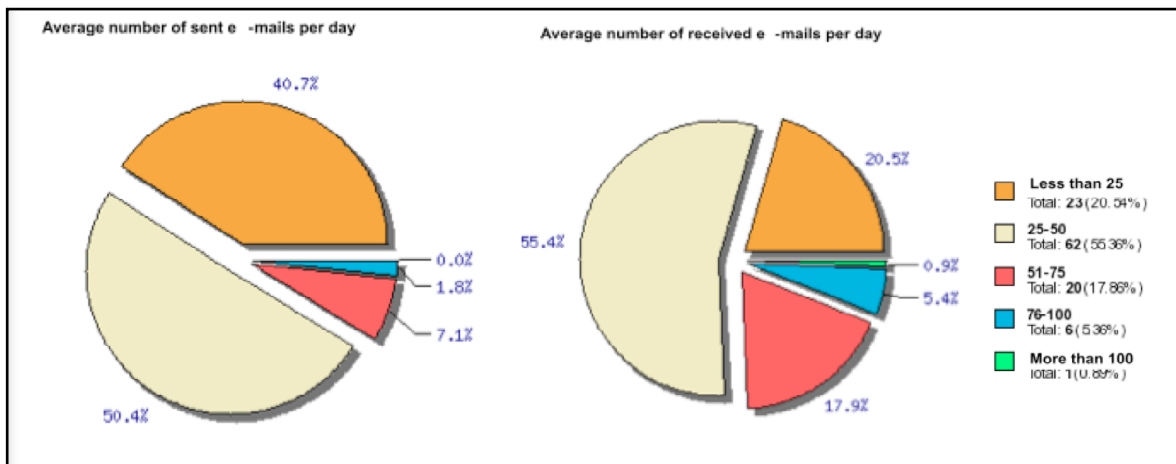


Figure 8. Sent and received emails daily in Business Services Finland

Survey (TS2010) highlights similar challenges than the ones found during the interview process. Respondents agreed or strongly agreed in terms of the following statements:

- 80% experiences interruptions as typical in their work
- 65 % experiences continuous interruptions as distracting in their work
- 71% does not have time to get to know the information they receive thoroughly

Further, based on survey data a cluster analysis was conducted to clarify the problems experienced. The questions and data included to analysis consisted of following statements and questions; (1) *I get the information I need at the right time*, (2) *I can continue the next 10 years in a similar manner at work*, (3) *I usually can't reach the person I'm trying to get in touch with*, (4) *Continuous interruptions are typical in my work*, (5) *I experience work related communication challenging and as a burden*, (6) *Work related communication takes too much time*, (7) *I don't have time to get to know all the information I receive*, (8) *Interruptions are distracting my daily work*, (9) *Communication media has a high impact on meaningfulness of my work*. The cluster means can be found as an appendix (5).

5 clusters were formed and named as follows; (1) *Successful communicators*, (2) *Communicators in risk*, (3) *Sufferers*, (4) *Adapters* and (5) *Efficient communicators*. The number of employees belonging to each cluster was divided somewhat evenly across the clusters (table 11). Clusters indicate different profiles amongst employees; perceptions of work and communication related problems are different between the clusters. There might be several reasons behind the different viewpoints, which cannot be articulated in the scope of this study. However, the profiles and experienced problems support the challenges identified based on the interview data analysis.

Cluster Summary						
Cluster	Frequency	RMS Std Deviation	Maximum Distance from Seed to Observation	Radius Exceeded	Nearest Cluster	Distance Between Cluster Centroids
1: Successful communicators	26	0.7213	3.4976		5	2.2678
2: Communicators in risk	30	0.7499	3.0464		3	2.1434
3: Sufferers	23	0.6356	3.0288		2	2.1434
4: Adapters	13	0.6730	3.1142		2	2.4535
5: Efficient communicators	21	0.6738	3.1869		1	2.2678

Table 11. Cluster summary

The first group, *Successful communicators*, are in top two groups based on every question, top group meaning here successful communication and low degree of problems experienced. This group does not find work and communication challenging, and experience no constant or distracting interruptions. The employees belonging to this group get the information they need on time, and feel that they have time to get to know the information they receive.

The third group, *Sufferers*, is the exact opposite for the first group based on almost every question result. This group clearly has problems with coping with everyday work and communication. Employees in this group experience constant interruptions and distractions, and they don't get the information on time. Work and communication is experienced challenging. Availability of colleagues is also an issue, and possibilities to get to know the information flow was low.

The second group, *Communicators in risk*, experience almost all the same problems than sufferers, but not as strongly. This group is probably on a way to same direction, than sufferers. The fourth group, *Adapters*, find information flow and interruptions to distract their daily work, but the availability and information gathering is not a problem. They also think they can continue at work with the same pace for the next ten years. It seems that these people consider information overload and interruptions as necessary "bad" they just have to adapt themselves to.

The last group, *Efficient communicators*, seem to be best in reaching the colleagues they are trying to get in touch with and acquire the information they need. They don't experience communication as challenging, and even though they experience interruptions, they don't consider them distracting. The constant interruptions are the factor separating this group from *Successful communicators*, who on their behalf don't even experience interruptions. Thus, there are significant differences in experiencing the challenges.

6. Discussion and Conclusion

In this chapter, the conceptual frameworks are going to be confronted by the empirical findings from the case organisation. With the aid of revised frameworks, the factors hindering efficient communication and media usage are presented and discussed. In the end of the chapter, managerial implications and limitations of the study are presented, and future research directions suggested.

6.1. Revised framework

The research frameworks are revised based on empirical observations, as the findings indicate somewhat different interconnections with the analysed factors than what was originally expected based on literature review. The comments for revised framework regarding factors influencing on media choice are presented first, after which the challenges experienced related to communication in knowledge work are discussed.

6.1.1. Factors influencing on media choices - altered strengths and relationships

Several factors influence on individuals media choices. Employees in the organisation seem to realise the *theoretical efficiency of media for different tasks*. Amongst TeliaSonera Business Services Finland employees, media capabilities are described in line with capabilities presented in Media Synchronicity Theory (Dennis et a. 2008). However, the actual choices made are often very different. In the everyday situations media is chosen based on variety of factors, like situational constraints (task, partner, incoming medium) but most importantly, to be able to make these choices between mediums, individual must have accepted the media to personal, active media repertoire. This media repertoire resulting from several factors is a list of different media, which is actively considered as an option when making media selections.

Watson-Manheim & Belanger (2007) suggest that organizational members select a communication medium from their *communication media repertoire* in interactions with colleagues. The existing repertoire of practices provides a frame through which usage decisions are made (Watson-Manheim & Belanger; Orlikowski and Yates 1994). The results from the empirical analysis indicate the same kind of phenomena. However, in this study it seems that in addition to socially emerged structures, media repertoires are also influenced by other factors like individual's IT skills, attitudes, training and past experiences. In addition, repertoires were classified into two categories; active media repertoires (the media which is actively considered when choice is made) and perceived repertoires (individual knows that the media is available, but does not use it for some reason). The major effect behind the choice is also the one of perceived media repertoires; which media is seen as available and acceptable to use in organisational communication in the organisation. Perceived media repertoire is resulting from organisation culture, structure and habits as well as norms. Media repertoires, both active and perceived, organisations influence as well as personal factors like IT skills have complex relationship. Thus, the conceptual framework has to be modified; communication media repertoires is not solely formed based on organisational norms and habits as claimed by Watson-Manheim and Belanger (2007), but also based on other factors, as can be seen from figure 9.

In conceptual framework, organisational influence (institutional condition), as well as appropriation factors and media repertoires were expected to be equal factors included to structuring conditions influencing on media choices together with media capabilities described in MST (Dennis et al. 2008). However, based on the empirical evidence it seems that the conceptual framework has to be altered in this case study regarding the role of rational choice and structuring conditions. Employees understand the theoretical capabilities of the media, but organisational factors, media repertoires; appropriation factors and individual factors pose restrictions to choice. These factors seem to have much stronger influence on choice than expected communication efficiency in theory and situational constraints. Organisation and its norms seem to have major influence on choice; if media is not perceived to be used in organisation, it is not considered as an option.

Further, *individual factors like low IT skills and attitudes* influence on media choices. These are classified as a different factor separate from appropriation factors. Dennis et al. (2008) classify familiarity with the medium to be appropriation factor. Though, based on empirical evidence in this study it seems that general level of IT skills can be influential on choice. Attitudes and IT skills in this study are considered as individual's characteristics, which are originated mainly outside the organisation.

Appropriation factors like training provided and past experiences of media in work-related usage have influence on choice as well. Dennis et al. (2001) defined training and past experience with the media as well as familiarity with media, partner and task at hand to be appropriation factors. However, the factors are differently classified in this study based on empirical evidence. *Partner and task related factors are classified as situational factors*, influential only after other factors presented in earlier chapters. However, the assumption that a good fit without the needed appropriation support is less likely to lead to improved performance (Dennis et al. 2001), gets support by empirical evidence. Training and experience with media as well as individual factors like IT skills have influence on the media selections.

Location and perceived usability of medium in addition limits the options and influences on media choice. In UTAUT (Unified Theory of Acceptance and Use of Information Technology) it has been suggested that performance expectancy, effort expectancy and social influence have effect on the adoption and usage of information technology (Venkatesh et al. 2003). This theory has not been considered in conceptual framework, but seems to be important when selecting media. Active media repertoire, on which situational conditions further influence is resulting from these previously mentioned factors.

Situational factors are classified as final influencer in revised framework (figure 9). Factors related to *communication partner*, like availability, familiarity and behaviour seem to have influence on media choice based on empirical evidence. Availability as choice criteria seems to be more related to familiarity of the communication partner, than previously expected. Straub and Karahanna (1998) suggest availability to be one of the key constructs in media

choices. However, the results from this case study indicate availability to be more connected to learned behaviour of communication partner, thus it is not a dynamic feature. Of course, in some situations, availability as a temporary feature influence on media selection.

Employees in case organisation tend to continue the communication via same channel where they originally received the message. This finding, indicating the *low mindful thinking when choosing media in some situations*, is consistent with earlier theories (Langer, 1978; Kirmeyer, 1988; Timmerman, 2002). In revised framework, task related factors like urgency, type and familiarity are classified as situational factors as well. As suggested before (Dennis et al. 2008), familiarity of a communication partner influences on media choice. Dennis et al. (2008) define task-media fit as influential factor. However, this study indicates that even though task-media fit is recognized in theory, the type of task, or communication, is only influential after the other choice factors like organisational influence and individual factors. The revised choice-framework is going to be presented in next chapter, combined to challenges-framework.

6.1.2. Challenges experienced – new problems found

The challenges experienced were similar to the ones expressed in conceptual framework in some degree, though also some new challenges emerged. Constant interruptions and information overload were challenges experienced in knowledge work in case organisation, like was anticipated in conceptual framework. However, based on empirical evidence interruptions are not always experienced as distracters, but taken for granted. Thus, interruptions, task closure attempts and stress don't seem to be that closely tied to each other than suggested by conceptual framework.

It is interesting, that in case organisation *interruptions* sometimes seem to be taken as normal and compulsory part of workday; they are experienced to occur, and it is everyone's own problem to minimize them. Some interviewees did not even experience them as distracting, but as normal part of workday. The results from survey indicate the similar experi-

ences; 80% experiences interruptions as typical in their work, whereas only 65 % finds them distracting. Results from cluster analysis further support this phenomenon. The members of the clusters found when analysing survey data experience communication and challenges in a very different manner, even though working in the same organisation. Interruptions seem to be problem also in broader context, as suggested in literature review; according to Finnish research (Työ & Terveys 2006), half of the employees were forced to often or constantly interrupt their current work tasks to give way to more urgent tasks.

Information overload and the burden of number of emails are looking to be the most widely experienced problem amongst the interviewed employees. The survey data supports the finding; 71% does not have time to get to know the information they receive thoroughly. Especially filtering relevant information is experienced challenging, and sometimes, important information is missed. Finding is consistent with previous theories; as Whittaker (2005) suggests, employees have difficulties in organizing and managing their email data. When processing information, only a minimal amount of information may be attended to (Langer, 1978) Mindless processing may occur especially with well-learned and familiar things (Kirmeyer 1988).

Attempts to close task and connection to work-related stress was not as evident based on empirical data, as assumed based on previous theories. Though, the assumption of closing tasks with email happens in some degree. As suggested in previous research, asynchronous media provides an option to close tasks while not interrupting recipient (Straub & Karahanna, 1998). Increased email load may occur because of task closure attempts, which might accelerate due to information overload in knowledge-work environment. Based on empirical evidence it cannot be stated that task closure attempts would directly increase information overload. Though, they might increase interruptions when employees check their email constantly (Taylor et al, 2008). However, the amount of emails and organising them in inbox in general was experienced stressful based on empirical evidence. Also, high usage of carbon copy emails increases the load.

In addition to challenges presented in conceptual framework, new challenges came up from the interview data; *inefficiency in knowledge management in organisation, difficulties posed by matrix organisation and unclear responsibilities/authorities, and lack of common communication tools an culture as well as problems with availability of colleagues* (see figure 9).

6.1.3. The combined framework - media choice, challenges and their relationship

As explained in the previous chapters, the strength and relationships of the factors influencing on individual's media choices have been altered. Similarly, the framework describing the challenges needed to be revised as well. Based on empirical findings, individual's media choice behaviour and factors behind it don't directly seem to influence on the problems he/she experiences. More so, inefficient media choices of group of employees communicating together (or the whole organisation) seem to cause problems like information overload, business, poor knowledge management and interruptions. The connection between choices and challenges is at organisational level, and single individual has minor possibilities to improve the situation. From individual's perspective, the challenge is connected to the whole organisations unified communication policies, or in lack of them.

The barrier to efficient communication still lies in the inefficient media choices of individuals, when sum up together. These inefficient media choices then accumulate and cause problems for the whole organisation and to all the individual workers.

The combined framework answers the following research questions:

- *What are the factors influencing on individuals' media choices in knowledge-work?*
- *What is experienced as challenging in organisational communication?*

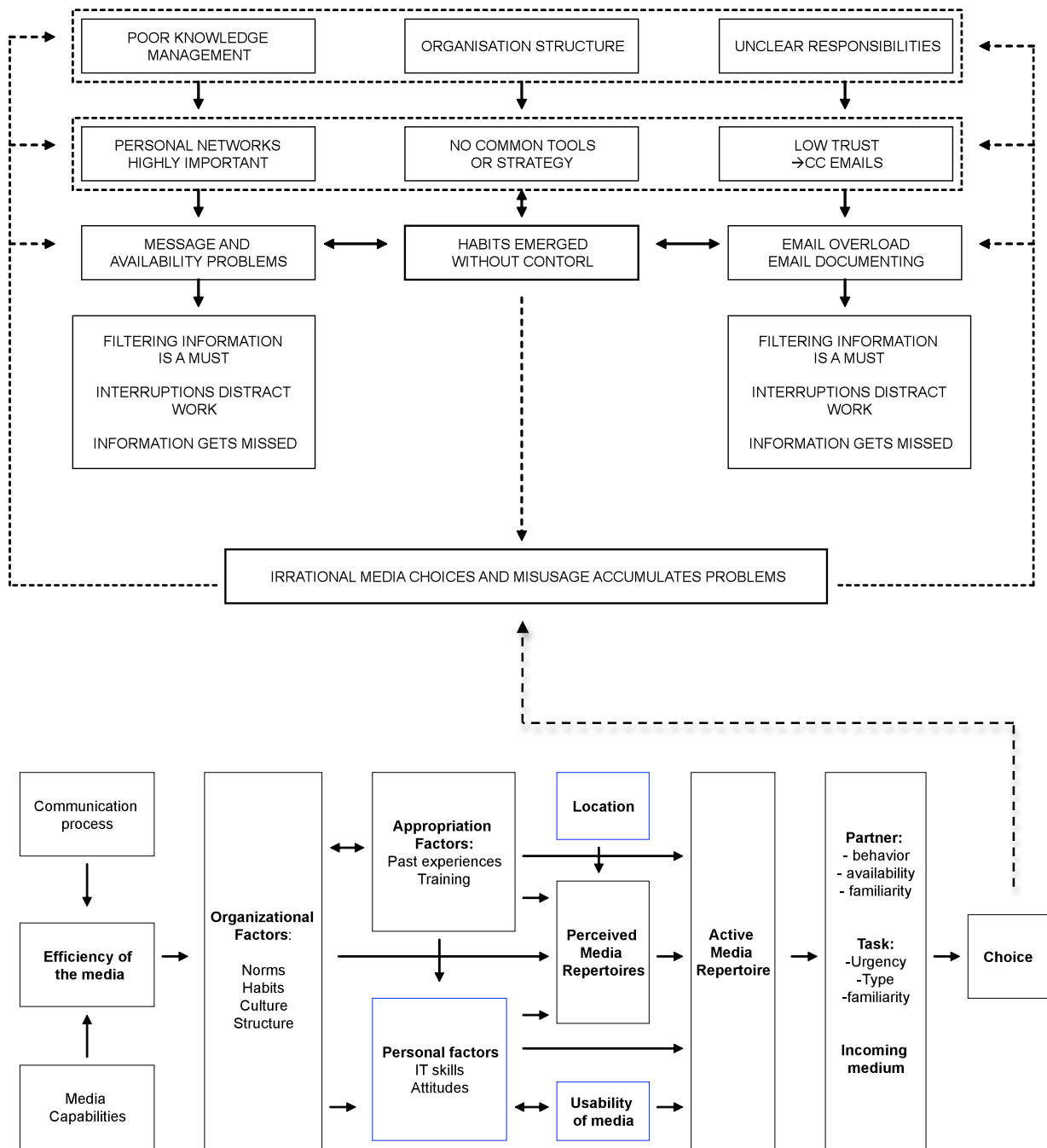


Figure 9. Revised framework

Robert and Dennis (2005) suggest, that in circumstances where individuals are not motivated or do not have the ability to process information, they will not allocate processing effort toward a received message and will not fully integrate the information with their previous knowledge. When this occurs, the elaboration likelihood is described as being low. (Robert & Dennis 2005) The accuracy of the assumption of Robert and Dennis (2005) in case organisation can't be evaluated, because in the scope of this research it was impossible to examine elaboration likelihood empirically. Though, low elaboration likelihood and mindless information processing seems to be evident in situations where information overload is present. Also, based on the fact that employees don't always choose the media based on theoretical efficiency, it can be stated that processing ability and motivation are not always as high as they should be to reach high elaboration likelihood in case organisation, which leads into low decision quality.

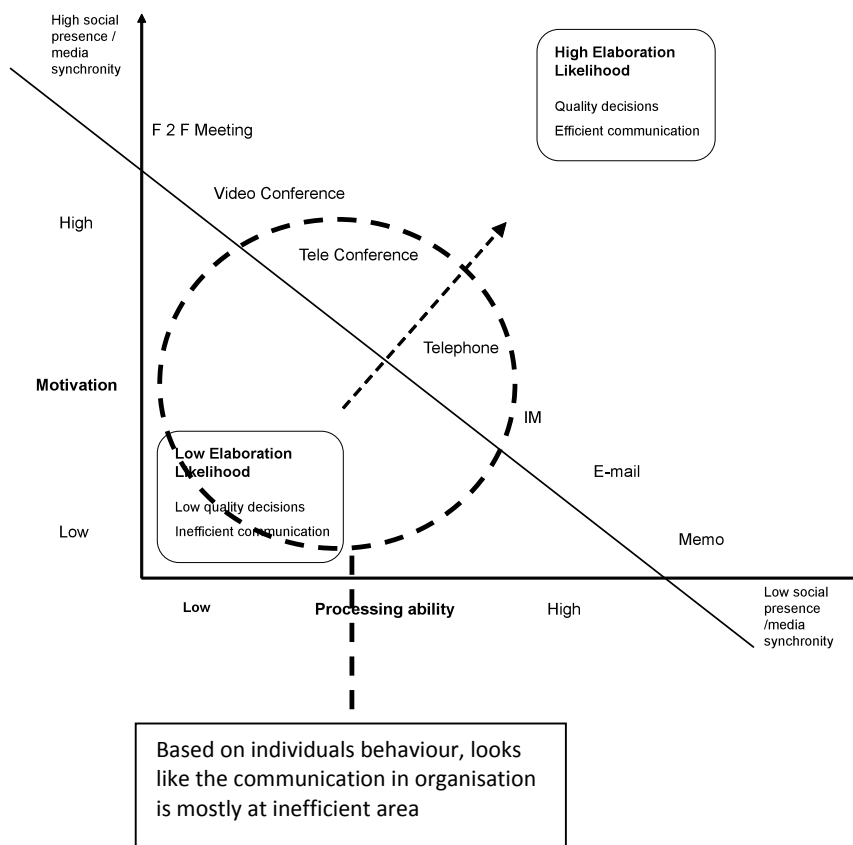


Figure 10. Link between media choices and challenges - low communication efficiency in organisation

6.2. Factors hindering efficient media usage

As stated in previous chapter, it seems that individuals in case organisation do not always choose media in an efficient manner. Other factors than theoretical communication performance, like media repertoires and organisational influence amongst others seem to have a strong impact on choices. Even though employees understand the capabilities and advantages of different media, they are not used accordingly. Factors presented in this chapter give possible explanations to the phenomenon. Barriers hindering efficient communication are found based on the challenges experienced and choice factors found from individual's perspective. This chapter thus answers to the main research question posited;

“What are the factors hindering efficient communication in knowledge-work organization?”

Generic categories of hindering factors	Consequent hindering factors
<p>Organisational co-ordination and management</p> <ul style="list-style-type: none"> - Uncontrolled culture and habits - Matrix structure - Low level of trust - Inefficient knowledge management <p><i>Strong influence</i></p> <p><i>Influences on Individual and Situational conditions</i></p>	<ul style="list-style-type: none"> - Narrow media repertoires - High usage of personal networks and low usage of formal systems - Perceptions of low amount of users → dominating email culture
<p>Individual's attitudes, motives and background</p> <ul style="list-style-type: none"> - Low level of IT skills - Negative experiences - Negative perceptions of usability - Strong old habits <p><i>Strong influence</i></p>	<ul style="list-style-type: none"> - Narrow media repertoires - Dominating email culture - Misuse of media capabilities
<p>Situational factors</p> <ul style="list-style-type: none"> - Perceptions of availability: people see availability as static feature <p><i>Final influencer: considered after other factors set the frame for possible media selection</i></p> <ul style="list-style-type: none"> - Urgency - Information overload - Incoming medium - Constant interruptions 	<ul style="list-style-type: none"> - Feeling of being busy and availability problems - Coping technique, interruptions “own choice” - Intuitive and irrational media choices - Compulsory information filtering

Table 12. Factors hindering efficient communication media usage

Factors are classified to generic categories to clarify the relationships; individual's attitudes, motives and background; organisational coordination and management and finally situational factors. All the factors presented in the table have restricting effect on efficient media usage and communication as stand-alone factors but also has complex relationships with other factors. Media capabilities and characteristics are not classified as factors hindering efficient communication; more so, usability and capability of the media are perceptions tied to individual and individuals' attitudes. The following discussion clarifies the relationships and overlapping factors to give deeper understanding of the influence of the factors presented in the table 12.

6.2.1. Organisational coordination and management

Organisation has significant role in influencing on individual's media choices. There are several different aspects related to organisational influence as follows; uncontrolled culture and habits, low level of trust, inefficient knowledge management, lack of training, and inefficient technology adoptions. Majority of the findings are well in line with previous theories and findings.

Firstly, *Organisation's communication culture* has high impact on individual's choices. Employees mainly use the media what others use as well. The influence of organizational norms on communications media use has been demonstrated in multiple studies (Fulk, 1993; Markus, 1994; Watson-Manheim & Belanger, 2007; Yates & Orlikowski, 1992). Established communication practices structure community's members actions; members also reinforce the practices (Orlikowski add Yates (1994)). Thus, it seems that organisation culture and established communication habits have significant influence on individual's media usage, and thus hinder efficient communication in case organisation.

Matrix organisation structure poses problems in terms of communication; almost all respondents work in a permanent team, which members mainly do their own tasks and do not work much together. On the contrary, lot of information sharing and communication is needed across the unit and team boundaries, and many interviewees often participate into

project teams. Thus, problem occurring from badly coordinated business unit communication across boundaries might be even more common problem than it seems. *Low trust, responsibilities and authorities* seem to be connected to individual's media choices. This finding is consistent with Watson-Manheim & Belangers (2007) findings regarding institutional conditions which influence on communication media usage; interpersonal trust and physical work place structure are claimed to significantly influence the decision to use a communication medium.

If knowledge management is not strategic and efficient in organisation, it has negative influence on communication and information flow amongst others. High usage of personal networks has connection to availability problems; personal email archiving increases the need to ask about the issue from a colleague, when information is not available from formal, commonly used sources. This might lead into availability problems. Usage of formal information management systems is low, which is also due to the perceptions of slowness. High usage of personal networks is confusing for new employees, and increases the message load. Personal archiving is inefficient knowledge management (Kaario & Peltola, 2008; Ojala & Pöysti, 2008). It is surprising that employees don't always use the formal information management systems, even though they recognise the advantages. Previous theories highlight the social influence and appropriateness for task; group support system is a social technology, so the way in which a group chooses to it, is affected by the fit of the technology with the group's habitual routines (DeSanctis & Poole, 1994). The problem might have connection also to badly organised implementation.

When adopting new media, *well-organised implementation is important*. What it comes to training, it is alarming that majority of interviewees haven't received training regarding communication media usage. *Training seems to have impact* on perceived media repertoires in organisation. It has been suggested that familiarity with and training on the use of the media can increase the likelihood that the media will be appropriated faithfully (Dennis et al. 2001; DeSanctis and Poole 1994). As Dennis et al. (2001) posit it is expected that a good fit without the needed appropriation support is less likely to lead to improved performance.

Unified Theory of Acceptance and Use of Information Technology (UTAUT) (Venatesh et al. 2003) seems to provide important insights to the topic as well. Theory was not included to literature review and conceptual framework, however, seems that it is worthwhile to include it to examination. Facilitating conditions defined in UTAUT influence on adoption as well; they are defined as a degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system, which includes guidance and instructions available (Venkatesh et al. 2003). Based on empirical evidence, trainings in TeliSonera are either too technical, or there is none. Thus the *lack of training in organisation and well organised implementation processes* may pose significant barriers hindering efficient communication, because the tools are not used accordingly even though they would be appropriate for the task in theory.

Training has also impact on the perceived media repertoires. Media options might be very limited, if individual's active repertoire is very narrow. Even though media capabilities and characteristics are understood well, media is not used if it has not been perceive available, or, most importantly, if it is not included to actively used media repertoire. Interaction between colleagues has effect on media choices (Watson-Manheim & Belanger, 2007). Social influence also has effect on adoption and usage and information technology (Venkatesh et al. 2003) Not even single interviewee listed all the media which in reality is available; Teli-aSonera has not succeeded in communicating the media options available for employees. Without clear instructions, media is not used appropriately and perceptions of low usage rates of certain medium may accelerate other medium usage (email).

Thus, media repertoire together with organisations influence maybe considered one of the major factors hindering employees efficient media choices. If media is not actively used, it is not actively considered when choosing media for task either. Factors like situation or availability are applicable as choice criteria only after media is in active use.

6.2.2. Individual's attitudes, motives and background

As presented in table 12, the following factors are included to this category; level of IT skills, old usage habits and patterns, past experiences, perceptions of usability, and own motives. These findings were not extensively considered in conceptual framework, and have not been part of the major directions of recent communication media research.

Findings from this study show that *low IT skills* limit the perceived and active communication media repertoires of employees. Also *expectations of usability* of the medium (related closely to attitudes and past experiences) influence on usage. Usefulness and expectations of usability have been proven to influence on technology usage significantly. Davis 1989 suggests that perceived usefulness is a strong correlate of user acceptance and should not be ignored when attempting to design or implement successful technology and systems (Davis 1989).

Performance expectancy and effort expectancy have effect on the adoption and usage of information technology (Venkatesh et al. 2003). The primary reason to adopt an application is the functions it performs, and the secondary reason is how hard it is to get the system to perform those functions (Davis 1989). Thus, if expectations are negative, it hinders the media usage and thus efficient communication in case organisation. To demonstrate the significance of the finding, it has to be noted that also Dennis et al. (2008) have posited that media appropriation is influenced by positive past experienced. As mentioned when discussing the revised framework, the role of usability was added to the revised framework. The factors seem to be important when trying to establish factors hindering efficient communication media usage in organisation.

Developed habits seem to hinder usage and limits active media repertoire. Even though certain communication medium would be available in organisation, it is not adopted to active media repertoire if old habits are strong. The initial set of communication media repertoires is often based on members' communicative experiences and genre knowledge gained in other communities (Orlikowski & Yates 1994; Watson-Manheim & Belanger, 2007). The role

of *negative experiences* should also be carefully considered; past negative experiences hinder usage and limit active communication media repertoires. Same as with developed habits; negative experiences of the medium may prevent the adoption to active communication media repertoire, which further limits the variety of media to choose from.

It seems that low usability combined with low IT skills and no training is hindering the usage of certain media. It can be assumed, that training, IT skills as well as usage background (attitudes and experiences) determine whether a person adopts a medium to active media repertoire (own media portfolio) and to perceived media repertoire (what is available in organisation). Training and IT skills seem to be connected to perceptions of usability in some degree. Often it seems to happen that perceptions of low usability or difficulties in using the system hinder the usage and adoption of medium. With appropriate training, this problem could be overcome.

Based on the findings, perception of the media capabilities might become a barrier to efficient media usage if the capabilities of the media are understood incorrectly. This problem is present with complex information sharing tasks within an organisation. According to Media Synchronicity Theory (Dennis et al. 2008) complex information should be shared with asynchronised medium, like email or document sharing, which gives the receiver the best possibilities for information sharing. However, during the interviews, getting to know complex information; combination of interaction and written media was the most commonly preferred way, on the contrary to Paradox of Richness –theory. Robert and Dennis (2005) suggest that written media/asynchronised media is best suited for communication conveying complex information. In the case organisation however, some employees preferred plain written material, some plain verbal training. Thus, Robert and Dennis's (2005) theory is not fully in line with findings; it might be that people learn in different ways, and this might alter the possibilities for efficient information processing.

On the other hand, it is interesting that often there were differences between the media they would use to deliver complex information and the way they prefer to receive information. It seems that complexity of the information send may not influence that much on me-

media choice from the viewpoint of partners understanding, but more so it is send in a media which provides the sender best possibilities to compose and deliver the material. People tend to choose media much based on their own motives and convenience in case organisation. Thus Robert and Dennis's (2005) points regarding best possibilities to process information might still be valid, but just not considered enough from the viewpoint of actual information processer in case organisation.

Wrongly exploited media capabilities combined to low trust explained in the previous chapter seem to be emphasising the email usage ion organisation, and thus hindering the efficient usage of alternative media. According to Dennis et al. (2008), email provides good possibilities for reprocessability, and these capabilities are very well recognised in TeliaSonera. Though, need for documenting seems to be overly emphasised in organisation, and unfortunately email is seen as a good way to do this. People seem to have high need to retain "proofs" from certain acts, but they don't recognise the low efficiency of email for documenting, especially from the viewpoint of whole organisations knowledge management. Need to use email as proof has been suggested also in previous studies; Kimble, Hildreth, and Grimshaw (1998) found that some managers were overloaded with emails because of the inappropriate use of the carbon copy (cc) function. Burgess et al. (2005) posit that employees may often copy emails to their superiors simply to "cover their own back". Thus, emails capabilities are recognised well in communication, but they are misused in terms of knowledge retaining and documenting. Even though email provides possibility to documenting as Dennis et al. (2008) elaborate, it does not mean that it is a best way to do it. Email documentation hinders the usage of document sharing in TeliaSonera, though also the lack of document sharing usage might accelerate email documenting. In case organisation, lack of IT skills and training might accelerate email usage for documenting purposes via limited media repertoire. Also, perceived lack of other users can pose restrictions for usage of alternative media like document sharing.

6.2.3. Situational factors

Based on the empirical evidence, situational factors are only considered, after other factors set the frame for possible media selection. Even though not being the primary barrier, situational factors can be considered constraints to efficient media usage and organisational communication. In this study, situational factors found hindering efficient communication found were perceptions of availability, urgency, information overload, incoming channel, and constant interruptions.

Employees in TeliaSonera see *availability* mostly as a static feature of the partner, not as a temporary and dynamic status. This is interesting because in previous media literature, availability is defined as a temporal status, and not so much related to familiarity of partner's behaviour patterns in terms of communicating. Straub and Karahanna (1998) claim, that availability is closely associated with why organization members choose certain media or technologies. Studies have indicated that asynchronous media such as email or voicemail are likely to be used when the intended recipients are not temporally available (Lee et al. 2009). However, in case organisation availability is experienced as a static feature of communication partner. Expected availability problems hinder the active use of media, even in case of media which would be most efficient option for the task at hand. These factors might even drop the media off from the active repertoire.

Availability becomes a big issue also in situations where people use differing "coping techniques" to survive from information overload and interruptions. Based on empirical evidence, individuals tend to turn off certain devices for a period of time when concentrating on other tasks. This is consistent with previous findings; Jackson et al. (2001) suggest that it is possible for employees to become more efficient if they change the duration in which their email application checks for new email. *Overload and interruptions* seems to have connection to coping in case organisation in general; people have to turn devices off when trying to concentrate, which further gives certain image to others about their availability.

Urgency in some cases hinders the usage of work support systems, because they are perceived as slow, and emphasises the usage of speedy medium like phone. Few interviewees also mention urgency alters their decision making processes. Timmerman (2002) has suggested that *incoming medium* may play an important role in determining which medium is subsequently selected. This seems to be true in case organisation; employees tend to continue the same channel. Strong organisational communication habits may reinforce the impact of incoming channel; email usage is overly emphasized in organisation, and habits of colleagues influence on choices. Thus the channel is easily selected according to these habits, especially if the original message was received through email. Consequently, incoming channel might also pose barriers hindering efficient media choices.

Information overload seems to be a common state in organisation. Employees experience, that they don't have time to go through the information they receive. The issue of using carbon copy email field in a wrong manner causes problems at many levels. Important information can be missed because emails are poorly targeted. Cc' mails increase information overload. The fact that people simply don't have time to go through the information influences on communication efficiency. Information overload also has strong connection to media repertoire and which media is used actively; some media has possibility to reduce overload (work support systems, IM).

Low levels of trust and need to document as well as habits, which are formed by themselves, accumulate over usage of email; have influence on information overload and stress. Advantages of alternative media are not fully recognised in terms of options for face-fo-face interaction. Thus, people in many cases choose the most interactive media available, which is usually walking to the colleague's desk or talking in the open office. This leads to increased interruptions in open office environment, even regarding issues, which could easily be communicated via intranet, document sharing or instant messaging.

6.3. Managerial implications

There is room for improvement in terms of communication in TeliaSonera Business Services Finland. The organisation has possibilities to improve internal communication efficiency by influencing individual-related and organisational level factors, and thus impacting on situational constraints and evolving challenges. The management should pay more attention to the organisations communication culture, and aim to control emerging habits and norms. Training employees is very important to ensure a sufficient level of IT skills. IT implementations have a very central role as well; adoption process should be carefully planned and conducted. The organisation should ensure that every employee is aware of the media available in organisation, and has sufficient skills to use it; at the moment none of the interviewed employees were aware of all the media options available.

From the organisations perspective, it might be difficult to influence on situational conditions, like availability. However, if practices for media usage were unified, the availability expectation should be more positive. Other situational constraints like familiarity of partner and urgency of the task maybe not be influenced by organisation. Though, issues related to information overload and interruptions can possibly be minimized by using the right medium for the task.

One of the most central issues is the overuse and emphasis of email, and low usage rates of other media in Business Services Finland. It seems that guiding users to use alternative media and minimize the unclear carbon copy usage would help to overcome the multiple challenges present in the organisations communication, like information overload which mainly occurs due to excessive emails and having to deal with them. Also the knowledge sharing would be more efficient, if more tools like document sharing were used. Decreasing email archiving also has a connection to availability issues; availability is essential in Business Services Finland due to complex services sold and the high need for co-operation. If information really can't be acquired from document sharing, then adopting new media like IM would aid the situation. Thus the workers would not have to call everyone when needing

information, but they would see who is available at the moment. Thus, also the amount of interruptions would decrease. The variety of reasons for low usage rates of certain media in Business Services Finland is demonstrated in the table 13.

Medium	Current status	Reason
IM	low usage	Experienced as informal. Perceived lack of other users, attitudes towards social media
videoconference	low usage	Technical difficulties, lack of IT skills, usability issues, perceptions of f2f interaction as the only right way
document sharing (Share Point)	low usage	Perceived lack of other users, experienced low usability and complexity, advantages not clear
work support system (TellU)	moderate usage	Perceived slowness, advantages not clear
intranet	low usage	Perceived as inefficient and confusing, advantages not clear

Table 13. Media with low usage rates and reasons listed

Generating the common rules for media usage is important, so that every employee does not practice their own coping technique and use of devices without clear common practices. It should also be remembered, that face-to-face interaction is not always the only option even for complex problem solving; by ensuring the skills of employees and availability of video conferencing services, this alternative could be used more. It is vital, that employees really know what media is available for them to use. Email, phone call and face-to-face interaction are not the only options – media should be used appropriately and matched to the task at hand.

6.4. Limitations and future research

This study aimed to explore the factors hindering efficient communication in organisation. Limitations and suggestions for future research directions are now discussed in brief. Firstly, due to case study method, only analytical generalization can be done based on the results of this study. To be able to generalize the findings more broadly, the factors found and frameworks should be tested in other organisations. It is possible, that the relationships of the factors would be different in other organisations. Especially, the need to document and low trust might not be present elsewhere, like the survey conducted in small and medium size companies indicated.

Secondly, the different types of communicators (profiles) in the organisation should be examined further, and explored in relation to the problems experienced; it might be that certain problems have connections to communication habits, but this area was impossible to examine in the scope of this study. Further research on topic could help in establishing why do different individuals experience the challenges in knowledge-work and communication differently, even when working in the same organisation and under the same culture? The cluster analysis conducted was aimed to be analysed further, but it was impossible to proceed with cross tabulations for the clusters, based on other factors like work position, due to small sample size. However, when tested, it seemed that the fact that individual works in daily customer contact has connection to higher amount of challenges experienced. This finding though was not confident due to small sample size and inability to use cross tabulation, but should be investigated further.

Thirdly, main empirical evidence was collected in the form of semi-structured interviews, thus the possibility of bias has to be taken into consideration. There is also possibility of sampling error; the employees interviewed may not represent the population perfectly. Due to budget limitations it was not possible to interview employees from other office locations. The backgrounds of employees were not extensively examined, which further limits the understanding of choice criteria and restrictions to efficient communication.

In addition, in the scope of the study, new media like wikis and blogs could not be examined, which limits the comprehensive understanding of media selections and communication efficiency. In TeliaSonera, these media were not used extensively, and consequently these should be examined in other organisations. After all, it is possible that some organisation use new media extensively. The age and work years of TeliaSonera employees were high, which might pose restrictions on new media usage and strengthen the developed habits and emerged communication culture. These new media solutions should be examined in similar kind of research setting in the future. It would be also advantageous to clear, in which scope electronic multitasking is done, and how does it influence on media choices.

Finally, as Robert and Dennis (2005) believe that to better understand how media effects a change in understanding, an approach based on cognitive psychology can offer additional insights to those offered by more traditional approaches solely based on social psychology. This area was only discussed at theoretical level in this study. The presented paradox poses a serious problem in organisational communication; it should be investigated in the future how much important information is missed because simply there is not enough capacity to process the information, or the receiver was not engaged to concentrate. Interesting fact is, that in case organisation it seems that the problems are not always identified, and challenges taken for granted in case of some employees.

6.5. Conclusion

This study originated from the assumption, that full advantages gained from ICT usage are yet to be achieved (Pohjola 2008). Especially in knowledge-work ICT could really provide advantages (Watson-Manheim & Belanger, 2007). However, if managed poorly, in some cases it could make the situation worse. Email, amongst others, has possibility to increase information overload, thus the right way in which to actually use communication media should be considered. It is especially important is to understand the motives and problems from the individual's perspective. After all, as Germonprez & Zigurs (2009) elaborate, communication is the essence of organizations, and technology is part of that communication.

Results of this study indicate that employees choose communication media based on multiple different factors and rarely solely based on theoretical efficiency. At the same time challenges like information overload and interruptions are experienced in daily work. It is possible, that the challenges are experienced, because individuals don't choose the media according to the purpose. It seems possible that in addition to the case organisation, the issues might be present in other Finnish companies as well. This study aimed to clearly identify the factors, which hinder the efficient communication in organisation; the factors found in case organisation were classified into individual's attitudes, motives and background; organisational coordination and management; and finally situational factors.

Examining and concentrating on the individual- and organisation-related factors could improve communication in organisation. It may not be always possible to impact on situational factors, though these factors can possibly be altered via organisational and individual factors. The individual employee has a very restricted chance to improve on inefficient communication alone, due to fact that the problem is primarily the one of the whole organisation. Thus organisation has a central role in providing satisfying working conditions for employees by influencing communication culture, and the habits and skills of the workers with the aid of training and clear instructions for media usage. When communication is efficient and media is used appropriately for the purpose, it has the ability to improve the decision-making quality of the organisation.

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Oxford English Dictionary

<http://dictionary.oed.com/>

Appendix 1: Interview structure

- First, we would like to confirm that you are OK with recording this interview?
- We are Aalto University students working on our thesis. We are studying internal communication practices in organisation in cooperation with TeliaSonera. An internet survey was conducted during the previous months, and now we are continuing with interviews.
- Interview is confidential, and respondent can't be recognized from any of the reports.
- Is there something you would still like to ask?

1. First we would like you to tell us about your work description and background

- What is your job description?
- Describe your typical workday?
- Are you in contact with customers on a daily basis?
- What is your work setting? Office? Location?
- How often are you at another location?
- How long have you been working for TeliaSonera?
- Has the job description changed during that time?
- Describe your IT skills?

2. Now, we are continuing with communication media and its capabilities

- Describe the communication tools in usage in TeliaSonera
 - What media/tools you use most?
 - Is there anything else available in addition?
- How would you describe the capabilities of communication media?
 - Describe the most used media, what capabilities and advantages it provides?
 - What is your background in using the two preferred media?
- We now list few capabilities. Which media has the following capabilities?
 - Rapidity of feedback
 - Interactivity
 - Parallelism e.g. Simultaneous transmissions
 - Multiplicity of cues: language variety, physical, verbal, visual cues
 - Rehearsability: is the meaning conveyed correctly?
 - Reprocessability: possibility for documentation
- Do media enhance your productivity at work? How?
- Would you like to have new media/tools? Elaborate.
- What is your attitude towards adopting new communication tools/media at workplace?

3. Next we are thinking of communication media choices

- Describe how you choose which communication media to use?
- Does the task at hand influence on the choice? How?
- What communication media in your opinion is best for:
 - informing others/ distributing knowledge
 - What media is preferred when sharing information and getting familiar with complex information? - if email, is there anything else in addition?
 - Solving problems and decision-making
 - What media is chosen for tasks which require high synchronicity, e.g. in situations where decisions have to be made and conflicts solved?
 - generating knowledge and coordination

- creating relationships
- Is there any media which could replace these?
- Describe how does situation influence on the media choice, in addition to previous factors?
 - How do you decide whom to include or ask?
 - Do you consider recipient when choosing the media? What about his/hers preferences?
 - How does location influence on your media choices? Yours? Receivers?
 - When you communicate, do you use different media with different partners? Does this vary?
- Is it normal to continue the same channel where you received the message from?
- What kind of informal communication do you have?
- Do you combine different media to solve a task? How? In what kind of situations?

4. Then, training in your work organisation

- Have you received training or instructions on media usage at TeliaSonera? Describe.
 - Technical or usage orientated?
 - What kind of training would you like to receive?
 - Have you tried to obtain information independently?
 - Have your colleagues instructed you?

5. No we would like to know more about the team you work with

- Describe the communication within the teams of which you are a member?
 - Describe the teams of which you are a member (or recent ones).
 - How are goals determined and agreed on and accepted? How are resources obtained?
 - Stability: Does the project team maintain the same membership over the life of the project?
 - How is information distributed to team members?
 - Describe the communication practices and instructions of your team.
 - What kind of things you communicate about?
 - What is the most common reason for organising a face-to-face meeting?

6. What about the communication culture at company level in TeliaSonera

- Describe the communication culture and practices in TeliaSonera
 - Is there expected reply speed/time for emails? Elaborate.
 - What are preferred communication media within the company, in your opinion
 - Is email used correctly? Do you receive irrelevant emails? Why? Would there be another way to take care of these issues than email?
 - How do you generally get the information you need? Is this satisfactory? Was it productive?
 - How do you generally get information that is not formally available
 - Do you use different technologies for obtaining information from outside your work-group/unit?
 - Is that similar to what other team members do?

6. Now, we would like to know more about your workday

- Do you have enough time to complete your tasks properly?
 - Do you have time to get to know all the relevant information you receive? How does this influence on your work?
 - Are interruptions typical in your work setting? Are they distracting? Can you come up with ideas how to reduce them?
 - How long is your workday? Does it continue at home? Do you have to do the creative work at home?
 - Describe your workday: usually it is experienced that 2 hours is reserved by meeting, 2 hours for dealing with emails, what about the rest of it?
 - Describe how you prioritize work tasks?
 - When are you at most productive? Elaborate? Do communication tools influence on that?
 - What do you feel are the biggest challenges and problems faced by individuals like you who -work given your distributed work environment?
 - What is stressful at work?
 - Would you like to continue in this kind of work environment for the next 10 years

(7. Finally, we are talking about OCS and organisational change)

- How do you expect OCS-tool to influence on your work? What kind of expectations you have?.
 - Do you believe that OCS is going to provide you the possibility to work faster?
 - Do you believe OCS is going to enhance your productivity?
 - Do you believe OCS to make your work easier?
 - How do you think OCS is contributing to the quality of your work?
 - Could OCS give you better control over your work?
 - How flexible do you think OCS will be?
- How easy will the adoption be/how much effort you think it is going to take? Which factors influence on this?
 - Is it usually difficult for you to learn new applications? What do you believe the situation with OCS is going to be?
 - How easily you remember the things you learned? Do you believe that it is going to be easy to get back to OCS usage even after a break?
 - How effortless you believe the usage of OCS to be?
 - How do you experience the mistakes you make with applications and tools? How important it is that the application is quickly usable again after errors?
- Do the previous factors and expectations have influence on your willingness to adopt new tools?
- Is there any ways these expectations could be altered?
 - Training? What kind? Playful, entertaining, serious...? tuki
 - Motivating? Role models?

Closing

- Do you have any other comments, or issues you would still like to talk about? Thank you!

Appendix 2: Interview question categorized according to theories (basis for interview and analysis)

A. Media synchronicity: *from capability theories and task fit theories*

Matching communication process to media capabilities:

1. General media choice:

- Describe how you choose which communication media to use?

2. Capabilities:

- How are capabilities perceived?
 - Describe the most used media, what capabilities and advantages it provides?
 - Describe how different capabilities of media influence on media choice.
 - Which medias enable “synchronous” communication with partner? Why?
 - Which media has the following capabilities?
 - Rapidity of feedback
 - Interactivity
 - Parallelism eg. Simultaneous transmissions
 - Multiplicity of cues: language variety, physical, verbal, visual cues
 - Rehearsability
 - Reprocessability
 - How would you describe the possibilities of new media, like video conferencing?

3. Task:

- Does the task at hand influence on the choice? How?
 - What media is chosen for tasks which require high synchronicity, e.g. in situations where decisions have to be made and conflicts solved?
 - What media is preferred when sharing information and getting familiar with complex information?
 - What kind of media is best for acquiring information?
 - What are the most common reasons for having a formal meeting?

B. Media Repertoires

1. Formal Media in usage: List the communication media you use.

- Is there anything else available in addition?
- What media you use most? Why? Describe them?

2. Informal media: What kind of informal communication do you have?

3. Combining media: Do you combine different media to solve a task?

- How? In what kinds of situations?

4. New tools: Would you like to have new media/tools? Elaborate.

C. Appropriation factors: *from older appropriation research?*

1. Usage Background:

- What is your background in using the two preferred media?

2. New media attitudes:

- What is your relation to new media/social media? Usage at the freetime?
-How do you experience learning new technologies? What is problematic?

3. Training:

- Have you received training or instructions on media usage? Describe.
-What kind of training would you like to receive?
-Are instructions for the usage of media easily available? Elaborate.
-Describe the TeliaSonera tech support and help desk practices.

4. Familiarity:

- When you communicate, do you use different media with different partners? Does this vary?
- What media do you use in everyday routine tasks? Does this change when conducting unfamiliar tasks?

D. Situational and Institutional Conditions: *from media repertoires*

1. Physical job setting:

- Describe your job
-Are you in contact with customers on a daily basis?
-What is your work setting? Office? Location?
-How often are you at another location? Do you have a choice in location?

2. Interpersonal trust:

- Describe the communication within the teams of which you are a member?
-Describe the teams of which you are a member (or recent ones).
-How are goals determined and agreed on and accepted? How are resources obtained?
-Stability: Does the project team maintain the same membership over the life of the project? -What is the average life of a project?
-How is information distributed to team members?

3. Organisational Incentives:

- Describe the communication culture and practices in TeliaSonera
-What is the expected reply speed for email? etc.
-What are preferred communication media within the company, in your opinion?
-What kind of things do you need to communicate about?
-How do you generally get the information you need? Is this satisfactory? Was it productive?
-How do you generally get information that is not formally available?
-Do you use different technologies for obtaining information from outside your work - group/unit?

-How often do you use these technologies? Is that similar to what other team members do?

4. Situation:

- Describe how does situation influence on the media choice? (excluding task at hand)
 - How do you decide whom to include or ask?
 - How does location influence on your media choices? Yours? Receivers?
 - Do you consider recipient when choosing the media? What about his/hers preferences?

E. Elaboration likelihood and stress/problems

1. Mindlessness:

- Do you have clear simple patterns which communication practises and media to apply in - certain situations? Describe?
- Is it normal to continue the same channel where you received the message from?

2. Do you have enough time to complete your tasks properly?

- Do you have time to get to know all the relevant information you receive?
- Are interruptions typical in your work setting? Are they distracting?
- How long is your workday? Does it continue at home?
- Do you have to deal with multiple tasks in your work? Describe how you prioritize work tasks?

3. Productivity and success:

- What factors would you say are most important to success?

4. Challenges:

- What do you feel are the biggest challenges and problems faced by individuals like you who - work given your distributed work environment? In a team?
- What is stressful at work?
- Would you like to continue in this kind of work environment for the next 10 years

Appendix 3: Different types of communicators in TeliaSonera

Type 1: Advanced communicators

Interviewees 4, 6 and 8	
Characteristics:	<ul style="list-style-type: none"> • High active communication media repertoire, • Advanced skills in communication, see communication as important • Orientated to task and several factors when choosing media • 2 out of three has received training • No direct customer contact • Different background and tasks and age
Media Choice Orientation	<ul style="list-style-type: none"> • They are oriented to task, and in addition, to easiness of usage, urgency (and learned habits of partner's habits) • Respondent 8 is highly orientated to documenting purposes, which emphasizes email usage in the media repertoire. • Even though media is used well in general, hurry and business hinder efficient choices; interviewee 6 admits that when being busy, media is chose intuitively.
Media Repertoires: active repertoires more than 5	<ul style="list-style-type: none"> • <i>Respondent 4:</i> active repertoire 8, full perceived repertoire 9 • <i>Respondent 6:</i> active repertoire 7, full perceived repertoire 7 • <i>Respondent 8:</i> active repertoire 6, full perceived repertoire 9 • Respondent 4 is the extreme case; this might be full perceived media repertoire (10) if sales support system is not in usage in her team. She uses as much as 8 media actively., but not IM. Though, respondent 6 uses 5 medium often and 8 uses 6 medium often, respondent 4 only uses 3 medium often. • Respondent 6 and 8 use IM (in active repertoire) and respondents 4 and 6 use document sharing.
Training, attitudes and IT skills:	<ul style="list-style-type: none"> • Respondents 4 and 8 have received training! • Their IT skills vary from basic to high level. • This group is comfortable in using new media solutions • Respondent 4 recognises the hindering effect of old usage habits, and wants instructions for usage. Considers also receivers preferences in media choices, if known
Comments:	<ul style="list-style-type: none"> • Media options and capabilities are perceived very well, but lack culture, business or love to some specific medium/dominating effect might hinder efficient media usage and communication. • The fact that others don't use medium is also limiting factor (4 does not use IM and 8 uses document sharing at low rate because perceived lack of critical mass).
Quotes:	<p><i>"I experience instant messaging as a good way to communicate – status update tells is a person is present and available for questions"</i> Interviewee 6</p> <p><i>"Information should flow better and faster in a company this big."</i> Interviewee 6</p> <p><i>"There is a need for basic training in house -, I have noticed that everyone can use email, but people have difficulties with other media"</i> Interviewee 4</p> <p><i>"Email is used very inefficiently in our organisation; I get lots of cc emails with no clue why was it sent to me. There would be room for improvement."</i> Interviewee 4</p>

Type 2: Traditional comfort seekers

Interviewees 5 and 9	
Characteristics:	<ul style="list-style-type: none"> • Low communication media repertoire limits possibilities to use media • Orientated to easiness of usage and own convenience • Traditional workers with established practices, communication not in strategic role • Both are customer responsible, daily customer contact • Different background and age,
Media Choice Orientation	<ul style="list-style-type: none"> • They mainly oriented to easiness of usage/own convenience/ own habits, which hinders efficient media usage. • Respondent 5 has very strong communication patterns, and he does not care how others are communicating. Respondent 9 is often choosing rich media, and he says that laziness in writing mainly guides his decisions regarding media choice.
Media Repertoires: active repertoires less than 5	<ul style="list-style-type: none"> • <i>Respondent 5</i>: active repertoire 2, full perceived repertoire 5 • <i>Respondent 9</i>: active repertoire 5, full perceived repertoire 7 • Respondent 5 has extremely low media repertoire, both active and full. This person is also the only respondent who claims, that there are no video-conferencing available in organisation.
Training, attitudes and IT skills:	<ul style="list-style-type: none"> • IT skills are on average level, no training received for communication media
Comments:	<ul style="list-style-type: none"> • Respondent 5 is the extreme case, he is the only one amongst all interviewed persons, who admits that partner or his/her habits has no influence on his media choices, he does not care what others do, he has his own practices. Respondent 9 experiences problems with information sharing; he thinks that business units are separate, and common tools and practices are missing, information flow is bad. Though, he thinks that communication media is accordingly used at the moment, he does not experience big problems with practices. • Respondent 5 experiences low trust in organisation, he thinks that responsible and authorities are extremely unclear, which increases email overload when no one wants to take responsibility.
Quotes:	<p><i>"I have my own practices and way of communicating; I am not interested how others are doing things"</i> Interviewee 5</p> <p><i>"When message is sent through Tell U, it may take 5 days before some one will process it in the support function, even though the issue would be very urgent - so, instead of formal system, the phone call is made to get through quicker. Unfortunately this is the way how it goes. "</i> Interviewee 9</p>

Type 3: New employee under organisational influence

Interviewee 0	
Characteristics:	<ul style="list-style-type: none"> Highly influenced by organisations practices and culture Modern, young communicator, but organisations influence limits perceived options Not in daily contact with customers
Media Choice Orientation	<ul style="list-style-type: none"> Receivers preferences influence if known Organisational habits have big influence on communication behaviour
Media Reper-toires: active reper-toires less than 5	<ul style="list-style-type: none"> <i>Respondent 0</i>: active repertoire 3, full repertoire 4 Even though full media repertoire is low in this study's scale, it is still very high in general use outside work. Social media and wiki are included in every day. However, this media is not included to this study, and she did not get close to full repertoire in terms of the determined list.
Training, attitudes and IT skills:	<ul style="list-style-type: none"> Has not received any training, but has good IT skills Has extensive knowledge of new media, and is different generation (much younger) than others. Positive attitudes
Comments:	<ul style="list-style-type: none"> Only interviewee, who has worked in the organisation only a short time, compared to everyone else who have been working over 10 years. Does not feel busy, or have trouble in getting to know information flow Experiences interruptions as normal and not distracting. Thinks that interruptions/open office is efficient communication and work place Has problems in finding information needed, maybe due to the lack of personal networks in house
Quotes:	<p><i>"I am not anxious in adopting new tools. However, it is important that the old tools are in control and handled well before taking new ones along."</i></p> <p><i>"Communication culture in the company is old-fashioned; everyone sends emails, no one makes a phone call."</i></p> <p><i>"No one has ever told me anything about communication habits or what media should be used. I have learned myself, I do what others do"</i></p> <p><i>"I can't find the information I need; I don't know who to ask from. "</i></p>

Appendix 4: Factor comparison

Resp	Media choice orientation	Media repertoire (full = 10)		Has received training	Has worked in the company over 10 years	Level of It skills	Continues typically same channel	Daily customer contact	Partners learned behaviour influences on choices	Media in active usage (high + moderate), <i>does not include low or not used media</i>	Perspective to interruptions	Stress and challenges
		active	full									
0	receivers preferences, receivers familiarity, organisations habits	3	4		no	high	yes	no	yes	email, phone + intranet	normal, no need to minimize	information sharing /seeking
1	Task, receivers habits, prefers rich media	6	7	yes	yes	low	-	no	yes	email, phone + Im,teleconferencing, SMS, document sharing	normal	cc emails, no common culture, unclear responsibilities
2	Task, urgency and partners availability, own practices	6	8		yes	high	can switch	no	yes	email, phone, IM + Teleconfrrencing, work support system, intranet	normal	cc emails, no common culture. no common tools
3	Urgency, task (extent), partner (bothering customers)	6	9		yes	high	yes	yes	yes/no	email, phone + SMS, work support system, netmeeting, teleconferenfig	distracting	email overload, cc mails, no common culture
4	Partners habits, task (urgency and importance), culture	8	9	yes	yes	basic	-	no	yes	email, SMS, phone +teleconferencing, netmeeting, videoconferencing, intranet, document sharing	distracting	cc mails, information sharing, no common culture
5	Own practices and convenience, urgency, (+task and familiarity)	2	5		yes	basic	-	yes	no	email, phone	distracting	unclear authorities and responsibilities, cc mails, email load
6	Task, availability, intuition, IM dominates	7	7		yes	basic	yes	no	yes/no	email, IM, phone, netmeeting, document sharing + intranet, videoconferencing	normal, no need to minimize	information distribution, no common culture, email load
7	Speed, availability=learned behaviour of partner	5	8		yes	basic	yes	yes	yes	email, phone, netmeeting + videoconference, SMS	normal	information management and sharing
8	easiness of use, task (extent), documentation important	6	9	yes	yes	high	yes	no	yes	email, work support system, teleconferencing, IM, phone +0	distracting	filtering relevant information, email load
9	Easiness of usage and convenience, rich media dominates, availability=learned habits	5	7		yes	basic	-	yes	yes	email, phone + intranet, document sharing, videoconference	not much interruptions	information flow, separate business units and tools

Appendix 5: Cluster analysis

Cluster Means									
Cluster	I get the information I need at the right time	I can continue the next 10 years in a similar manner at work	I usually can't reach the person I'm trying to get in touch with	Continuous interruptions are typical in my work	I experience work related communication challenging and as a burden	Work related communication takes too much time	I don't have time to get to know all the information I receive	Interruptions are distracting my daily work	Communication media has a high impact on meaningfulness of my work
1	4.0388	4.07692	2.50000	2.84615	1.84615	2.03846	2.68000	2.15384	4.46153
2	2.6333	2.93333	3.50000	4.37931	2.48275	3.03333	3.83333	3.96666	4.53333
3	2.7395	1.91304	3.52173	4.78260	3.69565	4.08695	4.52173	4.47826	4.78260
4	4.0769	4.23076	3.23076	4.46153	3.38461	4.00000	4.38461	4.30769	4.46153
5	4.1904	3.61904	2.19047	4.14285	2.28571	2.19047	3.76190	3.42857	4.80952