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# Useful and Useless Support for Knowledge Teamwork:

A Tribute to Ungrateful Users

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”Hovedfags”-thesis in Computer Science

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”I have done a case study of a dispersed team in a real life setting. The focus has been on exploring the contextual factors and the complexity of the team members’ communication patterns. The methods used have primarily been inspired by ethnography and grounded theory.

In order to interpret and understand the resulting complicated picture, I have turned to a variety of sources for inspiration where computer-mediated communication, computer supported cooperative work, and social psychology have been the most important. The goal is to gain an understanding of the probable broad range of factors underlying the communication pattern.”



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**This thesis can be found on the Internet in HTML, Postscript, DVI, and PDF format at**

**<http://www.apertura.ntnu.no/~greger/thesis/>**



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# Chapter 1

## Introduction

*This first chapter will introduce some of the visions and some of the problems of technology support for teamwork. I also state four important theses about research in this area. The problem of research writing will be touched, and my research project will be described by the research's three domains: the substantive, the conceptual, and the methodological domain. Finally, my research questions or research goals will be explored by analysing the meaning behind my main research statement: "I want to explore the communication pattern of a dispersed team in a real setting."*

### **1.1 About the visions for technology supported teamwork**

What is this thing computer supported cooperative work ? Or groupware? Or computer mediated communication? Or group support systems? Are they all the same?

They are at least all aspects of the same thing: they include two or more people who communicate with each other, and this communication is fully or partly supported by some kind of technology.

Early on, when research in this area first started, the future was glorified. Everybody was talking about the possibilities, and the enormous amount of travel cost reduction companies would get if they started to use video-conferencing systems and so-called groupware systems. Still, commercials for Lotus Notes and video-conferencing systems promise the same.

What do they promise? Basically, the main vision was, and maybe still is, that in the future you can cooperate as easily with someone far away as you would with someone just down the hall. Maybe this will be true one day, but we are still far away from this goal. Turning to newer research in the area, we still find a

good deal of optimism about the future, but we also find a lot of literature showing some of the complexity of cooperation.

Jonathan Grudin [Grudin, 1988] pointed out some serious difficulties in his well-known article: "Why CSCW applications fail: problems in design and evaluation of organization interfaces". Others had also pointed out psychological, social, and organizational difficulties in cooperative work supported by technology. ([Condon, 1993], [Galegher and Kraut, 1990], [Kiesler et al., 1984], and [Suchman, 1987], to name a few)

Lately, the amount of articles and books addressing such problems has grown immensely. Though, most of the contributions have a technological viewpoint, as they most often study some specific technology and identify non-technical aspects of interest. [Kraut et al., 1990a] and [Olson and Teasley, 1996] are two honourable exceptions. Most of the research is also done in experimental settings, again [Kraut et al., 1990a] and [Olson and Teasley, 1996] are two examples of the usage of other research strategies.

[McGrath and Hollingshead, 1994] are reviewing the conceptual and empirical contributions to the field and concludes that:

*"The problem is not that those sets of facts [from separate sub-bodies of work] disagree, it is that they cannot be compared, because they deal with different parts of the domain and do so in different research languages."*

They argue later on that future research should identify which subdomain of technology support for groups the research is done in, and that a larger number of variables should be taken into account.

After writing a 'mellomfags'-thesis in social psychology where I reviewed how social psychological knowledge was used in the field of computer supported cooperative work (CSCW)<sup>1</sup> [Teigre, 1996], I synthesized four theses found in the literature. These theses were my first motivation and inspiration (references are provided as examples):

- The construction of technology support for teamwork should be motivated by the needs of those who collaborate. This means taking into account the individual, the group, and the organizational aspects of real life collaboration. [Olson and Teasley, 1996]
- There is a need in research for group support to have a broader understanding of how teams collaborate in a real world setting. ([Suchman, 1987], [Harper, 1997], [Hepsø, 1997], and [Olson et al., 1993, p. 116])

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<sup>1</sup>Or focusing differently and more in line with this thesis: CWAC, cooperative work assisted by computers. CWAC was suggested by Professor Peter Checkland from Lancaster University in his opening plenary to the ECSCW'97 conference participants. (September 9, 1997)



- A cross-disciplinary and eclectic approach is needed to understand the complexity of collaboration. [Galegher and Kraut, 1990]
- The complexity of collaboration is immense, and ignoring this can result in a research body with contradictory results. [McGrath and Hollingshead, 1994]

In order to reach at least some of the visions for future collaboration, we must investigate dispersed collaboration with these arguments in mind. Even though the most spectacular visions probably not will come true, we will gain an understanding of how groups can be supported by technology in *the best possible way*. As computer support for communication and teamwork is rapidly entering large organizations, we need to understand how these new tools for communication and collaboration are interacting with existing communication, work organization and organizational culture.

[Olson et al., 1993, p. 121] write:

*"We will need to:*

1. *understand the fundamental nature of the group activity that we are attempting to support;*
2. *extend our understanding of the dimensions by which the important aspects of the situation, the task, the technology and the group composition affect work;*
3. *begin to build laws of group-technology behaviour."*

It is item one and two I am addressing with this exploratory study of real-life work.

## **1.2 Research writing: Describing the research process or building a cohesive story?**

There is a custom in research that you shall describe the most important parts of the research design needed, so that others can reconstruct and test your empirical data and conclusions. This originates in experimental research, but with other research settings, as case studies, it is not obvious how the study can be reconstructed and tested. The case in itself is unique! But the argument is still there: It must be possible to determine whether the research described is sound and well-constructed. In other, more scientific terms: It shall be possible to determine whether the results are reliable and valid.

This has led some scientists to describe the research *process* instead of the final research design. This way the paths and the detours will not be hidden, but will be visible for the reader to investigate, both for control and for enlightenment. This can be claimed to be important when the quality of the process itself and the validity of the steps from one thought or hypothesis to another are essential for the reliability and validity of the findings. But often honest scientists using experimental settings will also admit that the research results and the experiments done are the results of a more complicated and interactive process than you might think reading their research papers. We might suspect that this hidden process can be found in most of the research in the social sciences. McGrath suggests that research processes may well be guided by a qualitative study, more or less formalized, or just a hunch. [McGrath, 1994]

But describing the process is difficult, often you make decisions based on some intuitive understanding or experience. There is no place for this in mainstream science. Our tendency as humans to rationalise our choices and cover our weak conclusions and fallacies, make process research writing difficult. Another thing is that a description of a research process is difficult to read, it is difficult to grasp the whole picture. Following every little step in the researcher's path to understanding, is time consuming and tedious work. But this way you can be sure that you will discover and understand the underlying presumptions and the implicit assumptions and theories the researcher is carrying with her.

But is process writing the only way of ensuring that the reader is able to control the work done? I believe not. In the middle of process writing and a cohesive story, there is another alternative: The building of a cohesive story, but separately also presenting the essential parts of the process. An honest attempt of identifying your own implicit assumptions and theories while you conduct the research is also needed. [Robson, 1993, pp. 74-75] is referring to Shipman's similar suggestion for quantitative research, and names it 'scientific credibility'. Robson also claims that the same thing should hold for qualitative research, and mentions several researchers who recognize this view.

This is the approach I am using in this thesis.

## 1.3 My project

My research project was motivated by the four theses mentioned on page 2. While I later argue for my choices and describe the process (chapter 3.2), I will first present an overview of my project.

[McGrath, 1994] argues that "*doing research, in the behavioral and social sciences, always involves bringing together three sets of things:*" (p. 152) These three sets are the substantive domain, the conceptual domain, and the methodolog-

ical domain. The substantive domain is the domain from which we draw contents that seem worthy our study and attention. The conceptual domain is from which we draw ideas that might give meaning to our results. The techniques we use in our research are drawn from the methodological domain.

**Substantive domain** My substantive domain has been a specific project team in Statoil, Norway's largest oil company. The project team consisted of seven members located in different cities in Norway. After a while, I focused specifically on their communication situation, their way of organizing their work, the pattern of communication, and the how they chose to communicate in their activities. The substantive domain will be extensively covered in chapters 5 and 6.

**Conceptual domain** The areas I used for getting ideas and trying to understand what I saw, were computer supported cooperative work (CSCW), computer-mediated communication (CMC), management science, social psychology, sociology, and anthropology. While some of these fields will be represented more in this thesis than others, they all contributed to the development of my understanding, as well as to the directions taken in my work.

In particular I have extensively used the fields of computer-mediated communication, computer supported cooperative work, and the works of Joseph E. McGrath, a social psychologist. CMC is a cross-disciplinary field with people mainly from psychology, communication, computer science, and management science. At least some of the CMC area can be said to be common with CSCW. I guess most CSCW people would characterize CMC as a sub-domain within CSCW. But, in contrast to CSCW, which has come to be a field of its own with a strong basis in computer science, CMC has not been established as a separate community like CSCW, with their own journals, conferences and so on. This results in a more diverse group of contributors, and strong empirical and conceptual contributions from the varied fields of science.

Joseph E. McGrath has contributed in domains as management science, CMC, CSCW, methodology, and social psychology. His works on groups, interaction, and performance, as well as his methodological contributions have been inspiring to me. For a more detailed handling of the conceptual domain, see chapter 4.

**Methodological domain** I will in chapters 2 and 3 discuss the fundamentals of methodological choices, as well as my concrete design and research process. Summarized, I have done what the CSCW literature calls a 'workplace study'. [Plowman et al., 1995] It is a case study done in real life settings. Observation, email and database collection, and interviews have primarily been used. The

research process and strategy have been inspired by ethnography and grounded theory, without completely complying to any one of them.

These three domains form the basis of my concrete research questions.

## 1.4 Research questions

As argued in chapter 1.2, the process leading towards the research question can be both interesting and necessary. I will here present the main research topics the way they came to look after the process was finished. (See chapter 3.1 for a description of the process)

In order to capture the essence of my research goals, I have formulated my research project in one sentence:

*"I want to explore the communication patterns of a dispersed team in a real setting."*

This statement captures the following points:

First, I want to explore. This is in contrast to answering a research question or to determine a casual relationship. That is, I set out to try to see what was interesting to study, and therefore I do not have a narrow, predetermined focus.

Second, the communication patterns are in focus. A pattern is widely defined, and includes all communication modes and types. Studying a pattern also implicitly assumes some kind of time span. A communication pattern shows how topics, messages, and intentions are being communicated using email, databases, telephone, meetings, and so on. The pattern tells us about who uses what kind of communication tool for which kind of message, and to whom.

Third, this communication is not only found between two individuals, but in a team where a lot of factors can influence the communication patterns.

Fourth, this team is dispersed, or more specifically located in different cities. Their task is not to try to work as efficiently as possible at a distance, rather they have the infrastructure and tools available, and their main goal is to accomplish their project task as best as possible.

Fifth, a real setting means that it is a field work, with the richness and complexity found in such settings.

Decomposing my research statement while concentrating on what McGrath call the substantive domain, we get two intertwined areas:

- how the team with members situated at different locations organize the work and the internal communication.
- how the members choose medium/communication tool according to the task and the communication situation, and how they reason about making such choices.

These two areas will be visible throughout the entire text. This is what I have done, but what is the goal? The goal is to gain an understanding of the probable broad range of factors underlying the communication patterns.

## 1.5 A statement and a plan

Wrapping up the preceding sections, I can characterize my project with the following statement (which also can be found on one of the very first pages of this report):

*"I have done a case study of a dispersed team in a real life setting. The focus has been on exploring the contextual factors and the complexity of the team members' communication patterns. The methods used have primarily been inspired by ethnography and grounded theory. In order to interpret and understand the resulting complicated picture, I have turned to a variety of sources for inspiration where computer-mediated communication, computer supported cooperative work, and social psychology have been the most important. The goal is to gain an understanding of the probable broad range of factors underlying the communication pattern."*

Chapter 5 , The Organizational Context, describes the project's context. This context is essential to the understanding of both the areas above. Chapter 6, The Case, imparts the fieldwork, or the empirical data, if you like. A discussion of the empirical data, as well as a discussion of the empirical data seen in the lights of theory, follow in the chapters 7, Empirical Discussion, and 8, Theory Discussion. The last chapter takes a look at the consequences of the findings, and points out areas of interest for further research.

Before delving into the case in these three chapters, some background knowledge is needed on the research frameworks I have used and the theory which has

guided me. This can be found in chapter 4, A Framework for Understanding Knowledge Teamwork.

But very first, two chapters present methodology; the first discusses in general terms the fundamentals of research: paradigms, ontologies, epistemologies, methodologies, and all the questions you need to answer in order to conduct proper research. The second methodology chapter describes in detail the concrete research process and research design for my research project.

# Chapter 2

## Fundamentals of Research

*I will in this chapter discuss the general aspects of research methodology. First of all, I go all the way down to the basics and discuss the concepts of paradigms, ontologies, epistemologies, and methodologies.*

*This is not normally found in 'hovedfag' work, but I do this because I find it especially important to handle these matters when you are working in a cross-disciplinary field. A lot of the research in the computer supported cooperative work area show a very lenient relationship to research methodology. My main point is that as a scientist you should make your philosophical stance clear, and then step by step choose research strategy, research tradition, methods, and create the research design, all with an eclectic approach. This way you will get a research design fitted to your epistemological stance, the research goals, and the object(s) of your study.*

*Arguing for an eclecticism, I refuse to choose side in the qualitative versus quantitative and the research tradition debates. Instead, I suggest a step-by-step procedure of ensuring an eclectic handling of these questions.*

*But, I still relate my research design to the different traditions. The matters of reliability and validity are always important, and these are discussed in the last section. The research traditions found in social psychology and CSCW will also be discussed.*

### **2.1 Some thoughts on paradigms, ontology, epistemology, and methodology**

#### **2.1.1 The problem**

Very often you hear a researcher say that she uses discourse analysis, ethnomethodology, ethnography, or grounded theory or one of the many different research tra-

ditions or schools found in science. You know then something about the methods she uses, how an article written by her might look, and several other things. Most important, she has told you something about her epistemological stance. An epistemological stance is her view on three very important questions in science:

- *What is there to be known?* Is there an objective, real world out there somewhere just waiting to be observed. What are the elements of the world that science can be said to study?
- *What is the relationship between the would-be knower and what-can-be-known?* Is it possible to be a neutral observer and just measure or observe the elements of the world?
- *How can the would-be knower go about finding out what-can-be-known?* How should the measurement or observation be conducted in order to ensure that correct conclusions about the elements of the world can be stated? And what should be the form of scientific knowledge?<sup>1</sup>

The answer to the first question is called the ontology, the second, the epistemology, and the third is called the methodology. [Guba and Lincoln, 1994]<sup>2</sup> (See also [Britannica, Web ] for reviews, and [Buffalo, Web] for a through handling of ontology)

The researcher has not directly told you her epistemological stance, but you know it because the research tradition has a defined stance as a basis for the tradition. But are you sure that she is understanding that tradition's stance the same way you do? And are you sure that she once considered the epistemological stance and adopted it, and that she did not just choose a research tradition without consciously considering the epistemological stance?

If the researcher also said her epistemological stance was constructivism, you would know exactly how she would answer the three questions above. Why bother with epistemology, is it a problem? Yes, if she is not conscious about her epistemological stance, it will be difficult to discuss research design and methods with her. This is because she does not know the *reasons* for why she is using the methods she does. Complicating this, is the fact that there exists different versions of most of the research traditions, maybe with different names. And the

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<sup>1</sup>Not everybody would include the form of scientific knowledge as a part of methodology, but rather keep it as a separate, subordinate question. I find it here naturally to include it with the methodology.

<sup>2</sup>Note that what is called methodology is not the same as methods or techniques, but the methods you eventually choose will be a "natural" consequence of your methodological view. Also note that each of the questions, in succession, will influence the choices you have when making the next. [Guba and Lincoln, 1994]



number of research traditions are so large that very few researchers know them all.

Let us take a look at constructivism. Constructivism also represents what is called an inquiry paradigm. According to [Guba and Lincoln, 1994, p.107], a paradigm:

*"may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents a worldview that defines, for its holder, the nature of the 'world,' the individual's place in it, and the range of possible relationships to that world and its parts, [...] The beliefs are basic in the sense that they must be accepted simply on faith (however well argued); there is no way to establish their ultimate truthfulness."*

While a research tradition, let us say grounded theory, adheres to a certain inquiry paradigm, several traditions can share the same paradigm. An inquiry paradigm or a scientific paradigm is a short name for a set of concrete answers to the three questions defining the epistemological stance. In other words, a particular epistemological stance is an inquiry paradigm. Well, then things are simple, right?! <sup>3</sup>

No, you also have variants of each paradigm (like constructivism and radical constructivism). You can also find incompatible classifications of inquiry paradigms. [Guba and Lincoln, 1994] review different paradigms and include positivism, postpositivism, critical theory et.al., and constructivism. On the other hand, [Henwood, 1996] reviews three strands of *qualitative* inquiry: empiricism, contextualism, and constructivism. You may then ask: Is Guba and Lincoln's constructivism the same as Henwood's constructivism? An how do Guba and Lincoln distinguish between qualitative and quantitative inquiry? Another example is what [Henwood, 1996] says herself: *"...associated with post-structuralist and post-modernist theorizing. The latter two terms are often used interchangeably, and when distinctions are made these vary and can be contradictory."* And [Miles and Huberman, 1994, p. 4-5] write:

*"At the working level, it seems hard to find researchers encamped in one fixed place along a stereotyped continuum between "relativism" and "postpositivism." [...] In epistemological debates it is tempting to operate at the poles. But in the actual practice of empirical research,*

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<sup>3</sup>Things are actually not at all simple: A paradigm is more complex than I here try to convince you. For example, it often includes a strict guidance on research techniques to use, as well as other views you should share when adopting a paradigm. But the most important thing is still the epistemological stance.

*we believe that all of us—realists, interpretivists, critical theorists—are closer to the center, with multiple overlaps.”*

### 2.1.2 The solution?

In addition to what has been described in the previous section, names on paradigms are often used differently in different disciplines of research. The result of this, is that making a decision on an individual basis on which paradigm to choose, is difficult and time consuming. The solution for many is to choose among the paradigms or research traditions used in their field of science. Often, a certain field of science has a few research paradigms and traditions which are accepted. Another thing is that making another choice often defines you as being excluded from the establishment in that research area. This can have consequences for your doctoral dissertation or your possibilities for publishing.

The complicated situation just described and the difficult and philosophical nature of a paradigm, often results in a focus on the *methods* or *techniques* used, even when it is said that the paradigms are discussed. It is true that when choosing a paradigm or taking an individual epistemological stance, your decision will influence which research techniques you tend to choose. This is probably why it is possible to discuss techniques instead of paradigms. Ironically, paradigms which can be a help to structure the alternatives you get when answering the ontological, epistemological, and methodological questions, ends up creating confusion and "religious science-wars".

Instead of choosing a paradigm, I could have argued that you an independent definition of your epistemological stance was necessary. The problem with this is that a thorough and complete handling of this philosophical problem demands considerable time and words. And as almost all the important philosophers since the time of the ancient Greeks have contributed, it might be a bit naive to believe that starting from scratch is a fruitful approach (or that you can contribute much). If everybody defined their own stance, it would also be difficult to know who shared the same views.

I will not do this; I will show how my position is related to, and inspired by other paradigms. [Miles and Huberman, 1994, pp. 4-5] have a similar argument, and also write this about choosing paradigms: "*The paradigms for conducting social research seem to be shifting beneath our feet, and an increasing number of researchers now see the world with more pragmatic, ecumenical eyes.*"

The benefit of not choosing a particular paradigm, is that you avoid the limitations of the research techniques you are "allowed" to use. Such an approach enables you to have an eclectic view on the qualitative/quantitative distinction often discussed, as well as on the choice of the use of research techniques. On the

other hand, there is a need for a more detailed description of what you do and why you do it (as discussed on page 3).

You should be careful however, within a certain paradigm you can be pretty sure that it is possible to compare the research findings in that paradigm. Choosing a paradigm far from mainstream in your research area, or not choosing a paradigm, can lead you into problems. That is, the rationale for your research will not be accepted by other mainstream researchers.<sup>4</sup> Anyhow, research from different paradigms *are* compared. Whether this is right or not, and how it can be handled, I will not discuss here.<sup>5</sup>

### 2.1.3 My stance

The epistemological stance you choose closely follows the elements of the world that is of interest to you. And the other way around. An ontological position that there is a "real" world, and that it is only the physical characteristics of this world that there can be known anything about, do not leave much room for the social sciences. On the other hand, using phenomenology and inquiring into the experiences and the feelings felt in the area of physics, will give a completely different physics, if you can say that it is physics! It is when you come to the social sciences, that the debates about paradigms have been the hardest.

Related to the goals of my research project, I here pragmatically define my stance for this research project. I want to understand a complex social system as in sociology. I want to understand individuals in groups, as in psychology. And I also want to understand the relations between these. This gives me the following epistemological stance:

**Ontology** Social phenomena exist not only in mind, but also as something outside the human mind in the sense that they exist as a pattern of interaction between each individual's private representation of the same phenomena. A private representation is constituted by a person's assumptions about the social phenomena, as well as the relationships between them. Each individual may be the bearer of a more or less "correct" representation of these social phenomena and the relationships. The private representations and the patterns of interaction between these representations are what can be interpreted<sup>6</sup>.

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<sup>4</sup>It is interesting to note that this problem is leading to an enormous amount of discussion and statements saying that the opponent's work is not "scientific."

<sup>5</sup>According to [Miles and Huberman, 1994, p. 5], A. Lee argues for a layered approach showing that different perspectives adds different meaning, not necessary contradicting eachother. This could be a fecund approach.

<sup>6</sup>I do not write 'are what can be known' here. As you will see, my epistemology states that it is not possibly to "know" anything objectively.

**Epistemology** With an ontology as stated above, the researcher's own private representation will naturally interfere in the process of obtaining "true scientific knowledge." The researcher will interact with the elements of the world, and the knowledge must be constructed in this process. Findings are what is called "value mediated," or influenced by the researcher. This means that the conventional distinction between ontology and epistemology disappears; as they are interlinked.

**Methodology** Knowledge should be constructed piece by piece, linking the different elements together. Care should be taken to test all the assumptions in different ways. Missing links or unsatisfying explanations should invoke further investigations. Soundness of the knowledge is reached if every piece of the puzzle has its own position where it fits well. Despite this, you can never be sure that you have reached some "objective" view of the world.

Scientific knowledge can take any form, as long as its reliability, validity, and credibility are possible to assess for others than the researcher. (see chapter 2.4 for a discussion of these concepts)

The ontology is close to the relativist perspective of constructivism, and the epistemology is what [Guba and Lincoln, 1994, p. 110] call "transactional and subjectivist", which are common for critical theory and constructivism. The methodology is pretty close to Guba and Lincoln's version of constructivism, naturalistic inquiry and to the constructivism used in grounded theory. [Strauss and Corbin, 1994, p. 276] Of these three, the epistemology and the methodology are so close to constructivism, that they probably will be accepted as the stance rephrased. When it comes to the ontology, the notion that social phenomena exist outside the mind is common with realism, while the focus on interaction and construction of phenomena and relationships is closer to the relativist perspective. The viewpoint that the individuals' representations are important share some characteristics with phenomenology.

This will probably locate my epistemological stance somewhere between constructivism and phenomenology, but closest to a variant of constructivism. There might be a name for that paradigm too, but I have not been able to determine what it is. If this *was* a new paradigm and I set out to define this new paradigm, there would obviously have been a lot more questions to answer in order to defend the position. As argued in the last section, 'The solution?', using other paradigms as references avoids this problem.

Having defined the epistemological stance, it is now time to discuss the problem of choosing a research strategy.

## 2.2 Choosing a research strategy

The discussions on qualitative versus quantitative research have been hard and long. [Guba and Lincoln, 1994, p. 105] comment on the fact that the usage of 'qualitative' as an umbrella term superior to the term 'paradigm' is not uncommon. But they argue "*that both qualitative and quantitative methods may be used appropriately with any research paradigm.*" This is not a new approach; there is a tendency that more and more researchers advocate this view. I will therefore not use much space here on this question, but alongside the task of choosing a research strategy, I will comment on some interesting aspects of this dichotomy.

In the definition of my methodological stance nothing can be inferred about the preferences for certain methods. I am open to the use of all techniques in the hunt for knowledge. But often the techniques you know well and master will be used again in the next research project, what [Janesick and S., 1994, p. 215] is calling 'methodolatry', a combination of 'method' and 'idolatry', which is used to "*describe a preoccupation with selecting and defending methods to the exclusion of the actual substance of the story being told.*"

Before going on to the decision process, I need to be sure that the terms 'inquiry paradigm', 'research strategy', 'research tradition', and 'research design' are not confused. An inquiry paradigm should be clear, it is a set of conceptions around a certain epistemological stance. A research strategy, is a refinement of the methodological position, your choice of methodological domain. Which general strand of inquiry shall I choose for this particular study? A research tradition is a system of beliefs, experiences, and methods where the research strategy has been chosen. And finally, the research design is the concrete recipe for how you shall go about when doing this particular study.

### 2.2.1 The decision process

I will argue that loaded with your epistemological stance, you must determine the substantive, the conceptual, and the methodological domain you have in your current research project. Finding the methodological domain is about finding the research strategy. [McGrath, 1994] One alternative is to jump directly to a research tradition where the methodological domain is defined for you. As I prefer the eclectic approach, I will follow McGrath's approach of looking at three factors you always try to maximize: A. generalizability of the findings, B. precision of the measurement (and control of variables) and C. realism of the situation. He writes on page 155: "*Although you always want to maximize all three of these criteria, A, B and C simultaneously, you cannot do so.*" He introduces a "strategy circumplex" with eight different strategies: experimental simulation, field experiment, field study, computer simulation, formal theory, sample survey, judgment study

and laboratory experiment. These strategies differ on the scales of abstractness versus concreteness, and unobtrusiveness versus concreteness. A, B and C above will also have a maximum on different places on the circumplex. (See figure 2.1)

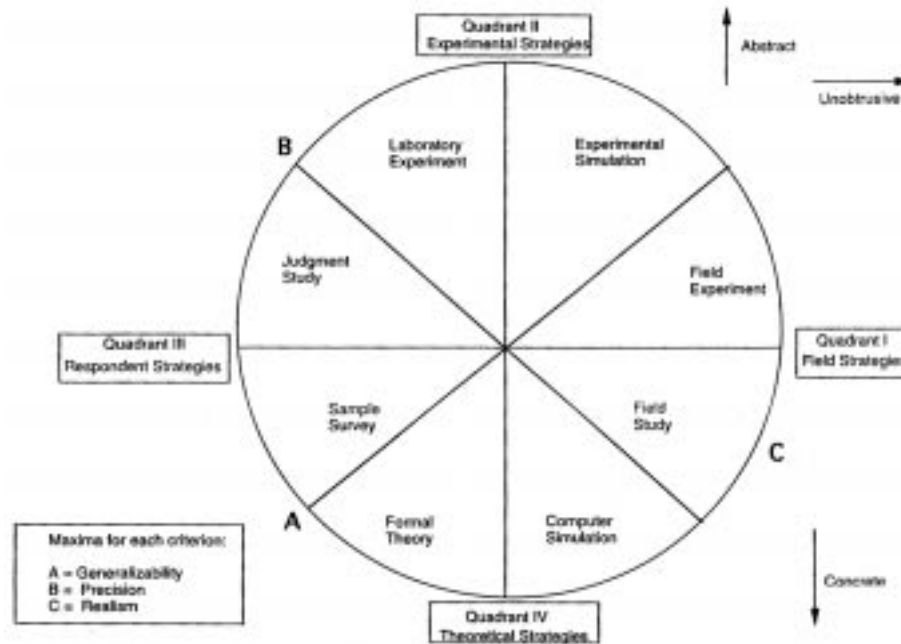


Figure 2.1: The strategy circumplex.

In order to determine if you want to prioritize A, B or C or a combination, you need to classify the purpose of your inquiry. [Robson, 1993, p. 42] differs between exploratory, descriptive, and explanatory research, where exploratory and descriptive research are described as high on realism, and low on generalizability and precision. While explanatory research is high on generalizability and precision, and low on realism.

Now, you have an epistemological stance, a substantive domain and a purpose of inquiry. As we always, whether we admit or not, will have an area of research and experience from which we are guided, you will also have a conceptual domain. You may now choose your methodological domain or what I earlier have called research strategy, for example from McGrath's circumplex.

It is now that I think it is time to take a look at the different research traditions within the methodological domain / research strategy you have chosen, and not before. Whether you choose a tradition or not, you must plan your research by creating a research design. The design will of course be influenced by the tradition you have chosen. This gives us the following step-by-step procedure for

your research project:

1. Define your epistemological stance or choose an inquiry paradigm.
2. Determine your substantive domain.
3. Determine the purpose of the inquiry.
4. Identify your conceptual domain.
5. Choose research strategy.
6. Choose research tradition (if desirable).
7. Create a research design.

It is very important to understand how each decision influences the possible alternatives of the next decision. This is exactly what I have argued for in this chapter. It is also possible to discuss whether determining the substantive domain should come before defining the epistemological stance. I find this to be true if you, like Leonardo da Vinci did, do research in very different areas. Most researchers stay within one substantive domain. In this case, the epistemological stance will probably be appropriate for all the research done in this domain. Since the epistemological stance is a belief and not knowledge, it is highly unlikely that someone changes the epistemological stance from an eclectic point of view. They will probably stay with it, unless they change their beliefs.

In chapter 1.3 I have described my substantive domain, and in chapter 2.1.3 I defined my epistemological stance. In the next section I will handle items three to six, while chapter 3.2 presents item seven.

### 2.2.2 My decisions

I have already in chapter 1.4 stated that I want to explore my substantive domain. On the dimensions of inquiry presented in the last section, my purpose of inquiry is exploratory, and the research strategy I choose should be high on realism. One research strategy is particularly high on realism: the field study.<sup>7</sup>

Choosing field study as my strategy gives me the opportunity of choosing between a large amount of research traditions: conversation or content analysis,

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<sup>7</sup>Note that McGrath's use of 'field study' includes ethnography, field studies in sociology and case studies of organisations. This is in contrast to [Miles and Huberman, 1994, p. 6] who in a classification of qualitative strategies classify field study as one branch of participant observation strategies and ethnography as another.

anthropological ethnography, phenomenology, ethnomethodology, grounded theory, symbolic interactionism, and more. Once again arguing for an eclecticism, I have not chosen a specific research tradition, but have borrowed experience and methods from several.

[Miles and Huberman, 1994]s' chapter on conceptual frameworks and their systematic review of qualitative traditions and methods have been very helpful. You do not have to share their paradigm in order to use their book; they cover all types of qualitative methods. They classify themselves as within 'transcendental realism', which they also group together with, among others, ethnographic content analysis and grounded theory. Although not building theory (see chapter 2.4) I have also been inspired by grounded theory ([Strauss and Corbin, 1994], [Pidgeon, 1996], [Pidgeon and Henwood, 1996])

When observing and while constructing a description of the case as found in chapter 6, The Case, I have used ethnography and a focus on describing the rich context of the case, or with ethnographical words: a 'thick description'. ([Toren, 1996], [Rachel, 1996]) summarized, this means that I have primarily used qualitative techniques in my project, but I also used some quantitative approaches in order to summarize findings.

## 2.3 Research strategy in social psychology and CSCW

A brief look at the research traditions of social psychology and CSCW, reveal that social psychology has been strongly influenced by the positivistic paradigm (like most of the social sciences), and is most often uses a hypothetical-deductive approach with experiments as the research strategy. Field experiments are also used. Of course, phenomenological psychology, psychoanalysis, and other parts of psychology have used other methods. But it is just recently you find psychologist arguing for the use of more qualitative methods. [Robson, 1993] presents case study as one of three traditional research strategies used in "real world research".<sup>8</sup> "The Handbook of Qualitative Research Methods for Psychology and the Social Sciences" presents several qualitative research strategies for the use in psychology. [Richardson, 1996] Among these are ethnography and grounded theory.

Although CSCW also originally adheres to the positivistic view often found in the so-called "hard sciences" like mathematics and physics, the cross-disciplinary nature of the field makes it possible to find almost any kind of paradigm and research tradition.<sup>9</sup> You will at least find ethnography, experiments, ethnomethod-

<sup>8</sup>Together with the experiment and the survey.

<sup>9</sup>As noted earlier, the synthesis of the research in the field is extremely difficult. [McGrath and Hollingshead, 1994]



ology, symbolic interactionism, surveys, content analysis, and theoretical approaches. The researchers from different fields provide the different approaches, and particularly the computer science researchers pick up the strategies they find interesting. This way the concept of 'workplace studies' was created. It is not very precise when it comes to methods, but a workplace study is very close to what McGrath calls a field study in his circumplex. The methods to be used are not specified.

## 2.4 Reliability and validity

No matter which choices you have made earlier in the decision process, you must consider two very important topics when building scientific knowledge: reliability and validity. Reliability is the problem of knowing if the measurement you are using is stable and trustworthy. Does a test give the same results at different times? Will two different observers come up with the same conclusions (inter-observer reliability)? Both because of errors made, and biases held by the observers?

We have basically three different forms of validity: construct validity, internal validity, and external validity. Construct validity is whether you measure what you think you measure. Are you measuring a pupil's skills, or her level of concentration? Internal validity is about casual relationships. Can you say that B is caused by A, and not by some unknown C? External validity or generalizability is whether you can generalize your findings to a larger group of people or phenomena than those you have studied.

This view on reliability and validity is found in the positivistic paradigm of inquiry. I will argue that in field studies and in particular when using qualitative methods, these matters must be approached differently and with criteria appropriate to that approach. [Smith, 1996, pp. 191-192] is making the same point, and covers five approaches for validating qualitative research: internal coherence, presentation of evidence, independent audit, and method triangulation. [Essler, 1997, p. 70] refers to Merriam and lists the following five validation means<sup>10</sup>: triangulation, information control by getting feedback on transcribed interviews, repeated observation of the focal situation, criticism and evaluation by colleagues, and elucidation of theory and the researcher's personal worldview to the subjects.

[Miles and Huberman, 1994, pp. 277-280] discuss reliability, internal validity, and external validity together with something they call objectivity and utilization. Objectivity is what I have called credibility (chapter 1.2), while utilization is "*what the study does for its participants, both researchers and researched – and for its consumers. We simply cannot avoid the essential addition of 'pragmatic validity'.*" (p. 280) Because of the nature of a 'hovedfags'-thesis, I will

<sup>10</sup>Actually six, but only five are of interest here.

not discuss utilization here. Miles and Huberman's approach to assessing these parameters are a set of queries to ask critically both while conducting research, while writing and afterwards.

When doing a case study where observation is used, one very important thing should be remembered: the limitations of the human as an analyst. Humans have systematic deficiencies and biases which should be consciously monitored. [Robson, 1993, pp. 374-375] is listing twelve different deficiencies, from data overload to the tendency of inconsistency between repeated evaluations of the same data.

summarized, we have the following seven means of ensuring reliability and validity:

- internal coherence,
- presentation of evidence,
- independent audit,
- method triangulation,
- information control by getting feedback,
- repeated observation, and
- elucidation of theory and the researcher's personal worldview.

In addition, we have a long list of topics, biases, and critical questions we should remember while doing research. As a part of the next chapter, I will describe my efforts to ensure reliability and validity as discussed here.

# Chapter 3

## The Research Design and Process

*In this chapter I will describe my project's concrete design, both the process of focusing the research questions and the methods used. My handling of the problems of reliability and validity will also be discussed. Problems I encountered and experiences I have gained occupy the last section.*

### 3.1 The research questions

#### 3.1.1 The initial stage

When I started out with my thesis work, my first aim was to find out how teams can be supported best possibly in their communication when group dynamic aspects were taken into account. That is, I had studied social psychology and was aware of some of the complex mechanisms in play when people meet, interact, and cooperate. I had also for a long time been interested in computer support for cooperation. My experience was that it was a large gap between the intentions of software developers and the actual use of systems for cooperation. The literature, together with my experiences, suggested that the models in use of how people think, interact, and cooperate with others were too simple. I started to review the literature available on groups and interaction, as well as earlier research done on teamwork supported by technology. I soon confirmed that the scope of my original aim was very broad and extremely cross-disciplinary. I touched at least the following areas: social psychology, individual psychology, management science, organizational psychology, organizational sociology, sociology, social anthropology, computer supported cooperative work, communication, computer mediated communication, group support systems, and organizational development.

### 3.1.2 Data gathering

I got the chance to follow closely a newly started project in Statoil. I was very well accepted and got access to all their meetings, as well as other gatherings and daily work. Soon, I narrowed down the scope and formulated a general question which guided my focus in the further observations: *What are people struggling with when communicating with other members of a distributed team?* My focus was primarily on the cross-disciplinary field called group dynamics. I also developed a simple framework for my field study. (see chapter 4.4)

I used observation and several other ways of gathering empirical data (the methods I used will be described later on). After doing some initial analysis, I found that I rather than study the struggles of individuals, should concentrate on the communication patterns and the interplay between these patterns and the surrounding settings. This focus was broader in scope again, but allowed me to see more of the overall picture. The individuals did not struggle alone, but in relation with other individuals, and the group, and the organization that were their surroundings.

I had questions like: How do things interact? Why do people use email, phone and meetings as they do? How do they think about how they communicate? How do they manage to choose the right communication tool for their message? What is a "right communication tool"? How do the task they are involved in, the group they belong to, and the organization they work in, influence the communication pattern? And a lot of other questions.

But, what I really was doing, was to explore this area, not to get definite answers. I therefore reformulated my research question into a 'research quest' which can also be found in the 'Research questions' section of the introduction. (p. 6) I also started to use a more comprehensive research framework. (chapter 4.4)

### 3.1.3 Research quest

*"I want to explore the communication patterns of a dispersed team in a real setting."*

In the introduction on page 6, I have explained the five main ideas behind this statement. Motivated by all the questions listed in the last section and my belief that context is important, I divided this quest into two intertwined areas:

- how the team with members situated at different locations organize the work and the internal communication.
- how the members choose medium/communication tool according to the task and the communication situation, and how they reason about making such choices.

A further splitting of these two areas into five research questions allowed me to use these questions to gather more specific data than I already had. The following four research questions in the next section depict the substantive domain of my field study.

### 3.1.4 Research questions

- How does the dispersed team organize its work and internal communication?
- How do the members experience working in a dispersed team?
- When asked, how do the members reason about media and tool choices?
- What are the observed communication patterns and the use of communication tools in the group?

I could have reported the field study as a single case, for example in the form of an ethnographic description. But I like trying to compare the world with theory, to see if there is a match. Theory is about the synthesis and construction of general principles describing and/or explaining the phenomena studied. With only a single case study, I will not try to build any theory myself, but I have tried to find theories from different perspectives which can shed light on my findings.

## 3.2 Concrete design and how my research has been carried out

As I noted in the chapter on choosing a research strategy (chapter 2.2, page 17), I have not followed one particular research tradition, but I have used methods and techniques from mainly three different sources: [Miles and Huberman, 1994], grounded theory, and ethnography. These three make out what I earlier have called the methodological domain. In this section I will explore the methods I have chosen from this domain, how I have used the methods, and why these are used.

In figure 3.1 you will find all the main elements of my research design. I have provided it here as a map for the further reading. Here is how to read it:

I have followed McGrath's division of research into three. In the middle you find the methodological domain. Strictly speaking, the methodological domain only consists of the methods, but in the middle and in bold on the figure you will find the research topic, my study "objects." The methods used are found right

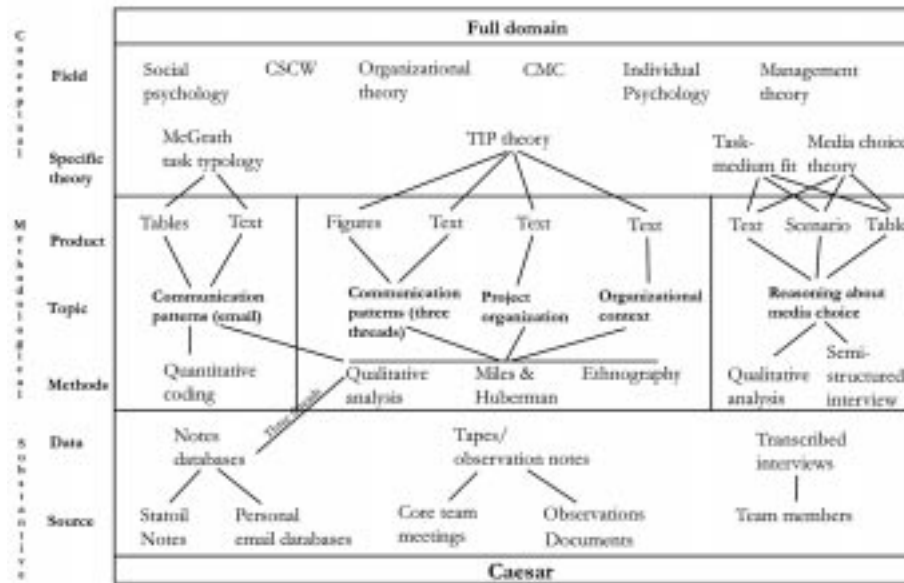


Figure 3.1: An overview of my research.

below, and above the topics you can find my "physical" findings in the form of products.

The substantive domain lists both the sources and the concrete data I collected. The methods just above the data are the methods used to handle the data. The 'Notes databases' data were used both in a quantitative and a qualitative analysis. (Note that I have removed the lines going from the data straight to the methods above, except the 'three threads' line.)

The upper rectangle shows the main parts of the conceptual domain. The full domain has of course influenced me in everything I have done. Below the full domain you will find the different main fields I have used in my research, and finally, 'Specific theory' shows the theories I have used explicitly and which products in particular they have influenced. The 'Methods' and the 'Specific theories' have been used together to study the 'Topics' and to create the 'Products'.

You may want to come back to this figure.

### 3.2.1 Observations

As mentioned in the last section I started out doing daily observations. Just after Easter 1997 the project I was to follow had a "kickoff-meeting", that is, they had earlier had some meetings and started the project, but this week long kickoff

meeting was the first time everybody met, and they were now starting the work. I was allowed to participate in whatever I wanted, and I used a tape recorder to record longer sessions. I used a book to continuously write down my observations. While I recorded, I wrote down information in order to find back on the tapes later, and things that could not be recorded. When not recording, I wrote down my observations. I concentrated on the interactions between the participants. At this stage, my focus was still on the level: how can teams be supported best possibly in their communication taking group dynamic aspects into account.

At this meeting more than 25 people were introduced. Only seven were members of what was called the 'core team'. The core team was headed by the project manager, and they had together the responsibility for the project and the decisions. The others were associated Statoil people, customers, and consultants. After this week of observation I decided to focus on the core team. They were in the centre of both the information and the decisions, and they had to communicate quite frequently. It was about that time I rephrased my research question into: What are people struggling with when communicating with other members of a distributed team?

The next three months I "lived" with the project. As the members were all situated in four different cities, I either had to travel around continuously to observe the different members, or I had to stay physically at one location and to try to capture as much as possible from there. As travelling costs a lot, I had not much choice and spent most of the time between Easter and the 1st of July with one of the core team members. Luckily, this person turned out to be one of three persons who were the most central in the project. I tried to capture as much as possible of what was going on between the team members, and I was also allowed to follow and tape record core team meetings which were held every fortnight. On these meetings I tried to talk to other members as much as possible, and sometimes I also spoke to them on the phone between the meetings. I wrote down all my observations, and also ideas and thoughts in a diary. In addition, I collected overhead presentations, papers distributed etc.

According to [Robson, 1993, p. 193], there are two major approaches to observation: narrative accounts and coded schedules. I did not use coding in my observation, but did a pure narrative account. The exploratory purpose of inquiry in my study called for a more open approach than a coded schedule would give. Choosing observation in the first place was also an obvious choice, as I at that time had no idea about what could be of particular interest.

Before starting the field study, I had decided to try to come close to the role "participant as observer" as described by Robson on page 197. "Participant as observer" is a role where it is made clear to the group that the observer *is* an observer. But establishing close relationships with members of the group is feasible. I chose this type of observation because the role as a concealed participant was

both not possible, and to my standards, unethical. The marginal participant, being largely passive, was not possible either; I felt it was not possible to be both completely accepted and to be passive at the same time. And finally, I do not agree with the theory that it is possible to be known as a researcher, do nothing, and have no influence on what you observe. In the next section on problems and experiences I view my role from the perspective of "getting in."

[Robson, 1993, p. 202-205] lists selective attention, selective encoding, selective memory, and interpersonal factors as four observational biases you should be aware of. In addition, you may influence the people you observe in several ways: how they behave, what they say, what they say to you, and what they let you see. With such a long period of observation as three months, I believe that after some time I did not influence the members of the core team of any significant degree. I was too unimportant and of no threat, and they grew accustomed to me.

When it comes to the observational biases, I have tried to be conscious about these problems, but you can of course never rule them completely out. (See also later on in this section the discussion of reliability and validity)

### **3.2.2 Email**

After the three month period, I gathered the email databases of five of the core team members. I did not get access to the last two. These included the three most central members, and after combining their email databases into one single database, the only messages I can have lost were messages going between two members who hardly knew each other and who worked on so separate areas that they did not have much to communicate about. This was confirmed by the observations done before, during, and after core team meetings.

### **3.2.3 Cooperation database**

The core team also had a Lotus Notes database at their disposal (ESOP). This database application was created by Statoil Data, the internal IT infrastructure organization. The database was meant for email and more formal documents concerning the project. The database was organized as a folder with subprojects and tasks within the subprojects. Except from that, the database could be used as each member wanted. The database also had a history mechanism where you could see who had read or written documents.

### **3.2.4 Interviews**

After analysing the material I now had, I once again refocused and came out with the final research quest and the questions I have presented in the last section. (The



analysis phase is handled separately right after this section) In order to assess the individuals' experiences, feelings, and reasoning, I conducted interviews. As I will explain in the next section on analysis, I picked three threads of contact, or patterns of communication, from the empirical data. These threads included three members of the core team, the three most active and influential in the project. I therefore chose to interview these three persons. Of practical reasons I did not interview more than these. The interviews were semi-structured, that is, I had a set of topics presented by a couple of predetermined sentences, and a set of topics used by me as probes during the conversation on that topic. The interview guide can be found in appendix A. The interviews were between 1  $\frac{1}{2}$  and 2  $\frac{1}{2}$  hours, and were all tape recorded. I did not transcribe the interviews word by word, but I extracted the meaning by transcribing the interesting citations and connecting the citations with descriptions of what was said.

I also included two other tasks for the respondents in the interviewing session. After the interview, they were asked to suggest a project- and communication organization for a four-member group where all were situated at different places. As a last task, they were asked to write a few words about what a certain type of communication tool was and was not suitable for.

Interviewing is an art: remembering not to ask leading questions, being polite and listen, not interpreting, but asking questions to get more specific answer, and so on. I had three advantages: I had previous experience with this kind of interviewing, I knew the respondents quite well, and they were all talkative, positive, and willing to give a lot of details. The transcriptions of the interviews are not included in order to protect the respondents.

The tasks mentioned above were deliberately put after the interview, because tasks like that force the respondents to reflect and reason about how they communicate and how they would like to communicate. By doing this as an interviewer, I influenced their way of thinking, and I had probably received different answers if the two tasks had been done in the beginning of the interview.

Of course, during my three months of observation, I also did a lot of unstructured interviews, or informal interviews. In these cases, the respondents obviously did not see themselves as being interviewed. This way I could get more detailed information on specific occurrences.

### 3.2.5 Analysis

During the observation period, I used the data gathered as a source for ideas, and as a place to find patterns. But I did no systematic analysis of the tapes recorded, as there was no time for time-consuming activities like transcribing and analy-

sis at that time.<sup>1</sup> After ending the observation and having gathered the email databases, I combined them all into one database, and coded the database according to the task type represented in each message. I started out exploring the database to find possible codes. After building a set of codes, I searched the literature for different classifications of task types, and found that McGrath's task circumplex of eight task types both covered and extended my original classification ([McGrath, 1990] and [McGrath, 1984]). I therefore used his classification to code the entire common email database. After this coding, two of the task types, execution-performance and generate-planning, were so large that further coding was necessary. By studying each of the categories three new codes emerged for each of them, which were used for more detailed coding. In the next chapter, A Framework for Understanding Knowledge Teamwork, I will present McGrath's typology of tasks, as well as other theoretical aspects of importance to my field study. The detailed process of coding requires an understanding of McGrath's typology. A description of this process is therefore found in Appendix B and not here.

Qualitative coding is said to be about trying out different codes, and "letting the codes emerge from the data." Purists will probably not approve of my usage of McGrath's typology. I find it absolutely legitimate to let theory guide you in your analysis. You must only be aware of two things: be careful not to miss something in the data because the theory do not cover it. There is nothing much exploration in such an approach. And when writing about your analysis, you must be sure to make explicit how theory has guided you.

Now, I used a quantitative method. I summarized the number of messages in each category, and then I tried to have a look at the numbers and the categories from "different angles." I also compared what I had found with my observations. It was interesting to see how different topics showed up in the observations and the email database. I now started to focus on the communication pattern I saw emerging, and I decided to pick up three different topics that all were going over some time span, were spanning different forms of media, and had some kind of importance to the group. For each thread, I created a chart based on the time scale and plotted the different contact points between the participants of the thread and included information about the medium used, content of contact, category of email messages, and so on. Looking at the pattern from different perspectives, I tried to find interesting aspects of the patterns and across patterns. This guided me in the work of creating an interview guide for the three interviews.

The analysis of the interviews was pretty straight forward. I coded each interview to find important themes, and synthesized this in different ways. A full description of the case and the results of the analysis can be found in the chapters

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<sup>1</sup>I also had problems with my back which caused severe headaches.

6 and 7.

### 3.2.6 Reliability and validity

The problems of reliability and validity are, as we saw in the chapter on fundamentals of research, problems that have to be handled throughout the whole research process. I have commented on some of the problems of each method in the previous section. These are problems that directly influence reliability and/or validity. Here I will handle the seven main issues I listed in the chapter discussing reliability and validity: internal coherence, presentation of evidence, independent audit, method triangulation, information control by getting feedback, repeated observation, and elucidation of theory and the researcher's personal worldview. These seven methods should, as argued in the mentioned chapter, be used in qualitative research to ensure reliability and validity.

Before I discuss these methods, I need to say a bit more about my field study. As said earlier, it is a case study with a strong exploratory focus. This means that I have no intentions of generalizing my findings. The case should be seen as a way of pointing out interesting phenomena and possible interpretations and implications. This again means that I will not claim to have found the causes of the phenomena I have explored. So, both internal and external validity will not be of utmost importance. Though, internal validity is also about the relations between the phenomena observed and my interpretations. This type of internal validity is very important to the discussion of the findings.

Now, the consequence of this, is that the seven issues used for qualitative reliability and validity do not need to be used too strictly. But still, reliability and construct validity are of great importance, and I have of course made my best effort to maximize these parameters.

I have done what I can to build a coherent view of the case. It is up to you, the reader, if this has been successful and if I can claim that I have *internal coherence*. I have also *presented* some *evidence*, in the form of the interview guide, but the main data material cannot be presented here. Mainly to protect the project members, but also because of the amount: 26 hours of taped meetings and interviews, more than 300 email messages, my own diary, and a Lotus Notes database of 37 Megabytes.

When it comes to an *independent audit*, my thesis supervisor has been an external reviewer of the case material. He has of course not gone through the whole data material, but he has still done some kind of an independent audit. I have done *method triangulation* in several ways. Two examples are: looking at the communication pattern both from the email and cooperation databases and from observation, looking at project organization both by observation and interviewing.

I have not done *information control by getting feedback* of two reasons: in

the first part of the study, I did not want to influence the project members in any way. That could have lead to methodological problems later. The last interviews were done just before the summer holiday, and it was not enough time to get the feedback. An exception to this is chapter 5 on Statoil as the organizational context. A long-time Statoil employee with no connections to my object of study, read and commented it. Of the same reasons I have only partly and very carefully *elucidated theory and my personal worldview*.

In some way you can say that I have *repeated the observation* of the phenomena. I have looked at different threads within the same case, and over a long time period. But I have not analysed, built hypotheses, and then gone back for repeated observations.

In addition, I do in this chapter as argued earlier: describe the research methods and process in order to give the reader an opportunity to assess the *credibility* of the research.

### 3.2.7 Ethics

I have not encountered many situations or decisions where ethics should be considered. The most important is to protect the identity of the members of the project and others in the Statoil organization. I also considered hiding the Statoil name, but decided that this was unnecessary as "everybody" knows the connections between Statoil and PAKT, and with the description of the internal organization, it would have been no problem singling out Statoil as the host for my field study.

I have tried to follow the scheme that as few as possible should recognise the true identity of both the project and the members. It is impossible to write about this case study without anyone being able to identify the project. The members of the project may also be able to recognise a person on a citation, but my goal is that people outside the project should not be able to distinguish the different persons.

During my observations and the period with the project team, I always asked for permissions for recording or observing, and I made clear what the research was about, and that the recordings and notes would be used for my research purposes only and then destroyed. On a few occasions I had to refuse to answer questions or to comment something I was asked to comment. These were situations where my recording or observing were the reasons for the question or request for comment.

I have otherwise followed the 'Ethical Principles for Conducting Research with Human Participants' made by the British Psychological Society; they can be found in [Robson, 1993, Appendix B].

### 3.3 Problems and experiences

This section deals in particular with the experiences I have gained, but also with the problems and the things I would have done differently now.

#### 3.3.1 Getting in

Most books on field studies devote a lot of attention to how you get access to the organization and the people. I had no problems at all, but I will credit this to the fact that I was associated with PAKT, Program on Applied Coordination Technology, which already had a positive relationship with the Statoil Research Centre. This relationship was anchored pretty high up in the Statoil hierarchy. Even though most of the members of "my project" had no connections with PAKT or the research centre, my PAKT association gave me the credibility and seriousness I needed in order to get in fast and painlessly. Another important thing was that I quickly was "adopted" by one of the core team members who advocated my entrance into the project.

Probably also of importance to my role in the project, was the fact that the project was a web development project and that I had a lot of experience in that area.<sup>2</sup> This gave me the possibility of being "the guy who is here for some kind of research purpose, but who knows what we are doing and can answer technical questions."

#### 3.3.2 Going native

With no problems of "getting in", I faced the problem known as "going native." That is, you become a part of the group you shall study, and will have problems seeing things "from the outside." As I early decided only to contribute on single technical questions, I was able to stay in about the same position the three months. I never took the responsibility for anything connected to the project. Having responsibility was a criteria for being a core team member, and I therefore never became a part of the group.

One thing that worried me though, was the fact that I of practical reasons was at the same location as one of the members. The connection there could easily have made the other members distrust me, and believe that I discussed my observations with this person. This would probably have resulted in the withholding of information from these other members, with the resulting problems this would lead me into later in the case study. But on several occasions I was able to demonstrate my independence and integrity. I also carefully queried a couple of the

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<sup>2</sup>I am the main responsible for a web site called Telemarkslauget Orwad found at <http://www.telemark.org/>

members about how they thought about the physical co-location with this person and my integrity. The answers were positive, and showed that I had successfully demonstrated my integrity. The interviews were also very open, and I have no reasons to believe that any of them withheld information or thoughts.

### 3.3.3 Skewed perspective

Another related problem is the "skewed perspective." Observing and seeing most of the incidents at one particular persons side, make it easy to interpret everything within this person's frame of reference. Again, the length of the study of three months, and with core team meetings every fortnight, as well as other types of meetings, I had the possibility to balance the view. The most important thing is that I realized the problem, and was able to actively prevent it.

### 3.3.4 Research questions, observation, and analysis

As you may have discovered, the final research questions did not become clear until pretty late in the study. This caused me an enormous amount of frustration, as I gathered tons of data and felt that I was looking at a giant elephant, but only at different, small parts of it, never the whole animal. This lack of focus has close connections with my observation and analysis practice.

I had no earlier practice with scientific observation and was thrown into it. Seeing back, my observation skills were not too bad.<sup>3</sup> But the intensity of the work (observation) and the lack of qualitative research skills at that time were probably the reasons for my problems with writing up field notes, writing memos, and starting the analysis. If I had managed to do this more systematically, I would probably have been able to focus the research questions earlier.

Qualitative analysis is difficult. In anthropology, there is a school claiming that ethnography can only be learned by long and extensive training together with experienced ethnographers. Some claims it possible, but that you should not underestimate the resources and skills needed. I spent a long time reading the literature, finding a lot of "magic" spells as solutions for qualitative analysis. The problem was the start; how do you break this code? Especially Miles and Hubermans' notions of coding qualitative data on different levels with pattern codes aggregating lower level codes and so on, and the use of different types of memos, helped me a lot. [Miles and Huberman, 1994] When I found out how I could use Lotus Notes for my analysis, things got a lot easier.

These problems with analysis, together with the fact that I got a part-time job taking a lot of time, caused the interviews to be taken almost one year after the

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<sup>3</sup>I have been working in a kindergarten with observation as part of the job. :-)

observation period. Now, I did not interview them about concrete situations from one year earlier, so the problems of post-rationalising and distorted memory did not become problems for me. What can be a problem, is that their views on project organization and communication may have changed over this year. This way, comparing my observations with the interview can bring methodological problems. I realize that this is a weakness with my study. But, looking at the respondents 4-6 years of experience with Lotus Notes, email, and project working, the period of rapid change of attitudes, habits, and opinions has passed. Hence, I think the problems of comparing are reduced to a minimum.

### **3.3.5 Lotus Notes**

I used a standard discussion database to gather memos, ideas, bits and pieces for the thesis, theory, practically everything. I created topics for each type of data, and I could discuss each contribution with myself by replying, or just changing or appending the original message. For the email messages, I used the Notes email database I collected them from. One especially great functionality for analysis in Notes is the possibility of categorizing all the documents or messages into several categories. By using different views, you can see the collection of data in different perspectives. I programmed my own views, but it is not necessary to do so in order to gain benefits from using Lotus Notes for qualitative analysis.

## Chapter 4

# A Framework for Understanding Knowledge Teamwork

*In this chapter I will lay the theoretical foundations for the understanding of the field study. It is very difficult to identify at which stages the different elements came into focus, as this has been a continuous process. Some of the theory presented here was early formulated as ideas, and then later discovered in the literature. Other things are my own and were conceived before and during the research process. I will try to introduce a time scale, so at least some of this process may be visible.*

*I will start with a short review of some of the relevant, earlier work done in this area of research. After this, I will explain why I use the words 'knowledge teamwork' and not only 'teamwork'; and I will discuss the most important concepts used in this thesis. While observing and while analysing I used two different research frameworks, these will be presented after the concept discussions. I will also present two of the most important parts of the conceptual domain which have been used during observations and analysis for guidance. These two are a comprehensive theory of groups, TIP theory, and an interesting notion of the necessity of a fit between the task and medium used for that task.*

### 4.1 Earlier related work

As I wrote in the introduction chapter, the literature body has the last few years grown fast in the area of technology support for teamwork. My cross-disciplinary conviction is also joining in to make the conceptual domain of my thesis work to become brobdingnagian<sup>1</sup>. The review of this literature is in itself a thesis worth.

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<sup>1</sup>As this is a rare word, and also a source of joy to a word-lover, I here include Random House Webster's explanation:



Hence, I will just shortly review the conceptual contributions in the computer supported cooperative work area<sup>2</sup>, and then introduce the literature of specific importance to my work (both conceptual and empirical work).

A bit rudely said, the field of CSCW consists mainly of six groups:

- computer scientists programming CSCW related software,
- computer scientists applying social science theories to their specific problems,
- computer scientists trying to understand cooperative work by using social science theories,
- social scientists who have entered the field of computers,
- social scientists who use computer technology as one of several cases to explore their own field of science, and
- researchers with a background in two or more fields of science.

In this way, the CSCW is a very diverse field, but twelve years after first being noted as a separate field, CSCW shows tendencies towards seclusion and the establishment of common norms, topics, and conceptions. In order to "have scientific progress" this is of course a goal for a field of science, but this might not be only positive in a cross-disciplinary field. The tension between the different areas diminish when common conceptions are formed, and the creative thinking and the room for new, competing ideas and conceptions gets less spacious. [Syvertsen, 1998]

This is not to say that CSCW has got nothing to contribute, but I find the field as a whole as described above. I find the most holistic and interesting contributions coming from the two last groups mentioned: social scientists using technology as a case, and bi- or poly-professionals. It is interesting to note, however, that few from the first of these two groups are known in the CSCW community, or they are at least not very often cited. This is not surprising, as few from this group have an interest in publishing in CSCW journals or conferences. They publish in their own fields' journals, and then go on to another case, often to test their theories as widely as possible.

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Brob-ding-nag-i-an (brob ding nag'ee uhn) adj.

1. of huge size; gigantic.

[after the land of Brobdingnag in Swift's Gulliver's Travels (1726), where everything was of enormous size]

<sup>2</sup>I will for simplicity include the field of computer-mediated communication (CMC) in the same review.

I will here categorize the contributions as coming from different disciplines. The researcher is not necessary from that field, but the theory or inspiration is often found in another field of science. The main contributions to this area of CSCW have come from sociology, anthropology, management science, computer science, and psychology. When I have made my choices, I have tried both to single out the most influential contributions in the direction of understanding cooperation as a complex and dynamic phenomenon, and to include those that I feel have contributed the most to my understanding.

### **Sociology and anthropology**

From sociology and anthropology the ethnographical methodology was soon adopted by a large part of the community. Ethnography has basically been used as a help for designing computer systems [Sommerville et al., 1994] and to explore the work place as in work place studies ([Plowman et al., 1995] and [Harper, 1997]). The problem has often been that nobody knows what to focus on. The last two or three years the amount of articles reporting on an ethnographic study has increased, and the understanding has been growing.

From sociology the concept of 'situated action' was introduced by Lucy Suchman. She uses an ethnomethodological approach and argues that all actions should be understood in their context. [Suchman, 1987] Her discussion with Terry Winograd on the language/action perspective versus situated action caused an enormous focus on situated action in the CSCW community. ([Suchman, 1994] and [Winograd, 1994])

Hutchins has an interesting study of the navigation of large skips, where he finds that the technology navigation "*does not amplify the cognitive abilities of the team members, but instead transform what are normally difficult cognitive tasks into easy ones.*" ([Hutchins, 1990, p. 191] and [Hutchins, 1995] for the book)

Kjeld Schmidt and others have used the concept of 'articulation work' found in sociology (Anselm Strauss) to analyse the activities needed when several people are mutually dependent in their work. Articulation is to "divide, allocate, coordinate, schedule, mesh, interrelate, etc." (See [Schmidt, 1994, p. 18] and [Fitzpatrick et al., 1995] for a use of Strauss' 'theory of action')

### **Management science**

From management science we have three classes of contributions: organizational aspects, decision theory and strategic, managerial aspects. The research centre called Center for Coordination Studies (CCS), found at MIT Sloan School of Management has been very visible. Wanda Orlikowski's two articles on the use of

Lotus Notes at Andersen Consulting are very well known, and gave attention to the organizational culture and the interplay between organizational change and groupware introduction. ([Orlikowski, 1992] and [Orlikowski, 1995]) Thomas Malone, also at CCS, has contributed with 'coordination theory', and was one of the first in the CSCW community who tried to establish a theoretical framework for the understanding of coordination. Schmidt, as mentioned in the sociology section, is another. ([Malone and Crowston, 1990] and [Malone and Crowston, 1994]) See also chapter 4.3 for a discussion on communication, coordination and collaboration.

Also at CCS, under a program called "Inventing the Organizations of the 21st Century", several researchers are working on the strategic and managerial issues of technology use in the future organizations. [MIT, web a] Here is an introduction taken from their description of the program:

*"Inventing the Organizations of the 21st Century. The overall goal of this landmark interdisciplinary effort is to work with business leaders and others not just to understand, anticipate, and exploit novel ways of working, but also to build on a broad-based knowledge of organizations, economics, and emerging information technologies to actually invent entirely new approaches that can be put into practice."* [MIT, web b]

Also from management theory, we find a lot of people working with 'group support systems.' Group Support Systems (GSS) are primarily a group of tools meant to support the group dynamics of a group's tasks. All the group members are usually physically together, but not necessary. Most of the systems have focused on what is called 'brainstorming' and the decision process. In cooperation with psychologists, the factors important in this kind of interaction have been thoroughly investigated. Some systems based on the knowledge gained are actually about to become a commercial success.<sup>3</sup> (See [Kraemer and Pinsonneault, 1990] for a review of empirical research in the domain and [Nunamaker et al., 1991])

Related to management science is organizational development. From this area Tora Bikson and others have used the socio-technical framework in the analysis of groupware introduction. [Bikson and Eveland, 1996] The socio-technical approach views the organization as consisting of two systems: the social and the technical system. These two systems interact and influence each other. This theory was much used in the earlier studies of technological change in production industry.

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<sup>3</sup>Please note that this area of management research is only partly connected with the CSCW area. Some publications are cited in CSCW publications, others are not.

### Computer science

It is difficult to say that some contributions "come from the field of computer science." The area is a mix of all kinds of theories from the humanistic and social sciences, as well as independent conceptual contributions from computer scientists. The contributions are listed here because I have not been able to find a source of the work.

A lot of researchers from the field of HCI (Human-Computer Interaction) have contributed to CSCW. Terry Winograd as mentioned earlier, used Searle's speech-act theory as a starting point designing an extended email system. Also mentioned earlier, in the introduction, Jonathan Grudin has been very influential in the CSCW area. His articles on the challenges for CSCW computer systems, and his focus on organizational and social factors coloured the further research. ([Grudin, 1988], [Grudin, 1990], [Grudin, 1994b], and [Grudin, 1994a])

### Psychology

Cooperation is about people interacting, and as psychology and especially social psychology is concerned about this, this discipline is therefore a natural place to search for help.

[Kiesler et al., 1984] gave already in 1984 one of the first contributions on the different psychological effects of computer-mediated communication. Later, the consequences for interaction and the individual when communicating electronically have been studied extensively. De-individuating, more even distribution of participation, lower trigger level of aggression due to lack of non-verbal signals, and social presence are just some of the many observations done.

The understanding of conflict and breakdowns have been an area of research for Steve Easterbrook. He is using a method called 'breakdown analysis' where the communications occurring before and after breakdowns are analysed. He is also using the concept of 'shared understanding' and claims that communication breakdowns occur when the lack of shared understanding become apparent. Both breakdown analysis and shared understanding have become used by many in the field. ([Easterbrook, 1994] and [Sharples, 1993])

Activity theory (AT) was first introduced in the HCI area, but was also soon transferred to CSCW. AT is originally a developmental psychology theory on children's development and learning. (Vygotsky and Luria) It has later been used in several areas. See [Bødker, 1991] and [Nardi, 1996] for a coverage. [Bardram, 1997] is an excellent example of the more practical CSCW use of activity theory. He also integrates AT with situated action in his workplace study of a hospital.

Joseph McGrath has contributed with his theory on time, interaction, and per-

formance, which includes a task typology and a theory of group interaction. The theory has a strong focus on time and group development aspects. As I have used McGrath's work as one of the theoretical foundations for my work, his theories will be covered in more depth later.

### **Other areas**

Others have also contributed to the understanding of computer supported work. A lot is done in research laboratories of the large technology corporations like HP, Microsoft, Xerox Parc, and the like. The Groupware conferences held in the USA cover this area. There is not much contact between the CSCW and the Groupware communities. To a certain extent the Groupware people cite the CSCW literature, but not the other way around. This is interesting, as this is normal in other research areas too, but I thought it was different in a field of science where the usefulness of the research is so emphasized, and where the need for real life research is so apparent.

There are of course other areas than those listed here which have contributed to the CSCW area. But often "common knowledge or beliefs" from a certain area is used implicitly in the research; other times it is not possible to distinguish the original contribution from the changes, add-ons and aggregates done by the CSCW researchers. This is often the case with contributions from communication research. Many researchers use for an example an implicit model of communication in their research.

### **Work specifically relevant to my work**

All the work referenced above contribute to different aspects of the same challenge: How can teams be supported in the best possible way with technology? They have all in common that they have influenced the directions of the CSCW area. Here I will mention the work that can be seen as pre-cursors to my work.

First of all, I will like to refer to the very first section in the introduction on page 2. Here I presented four theses I had synthesized from the literature. The works listed there represent ideas and projects similar to mine. McGrath and his crew have done two large longitudinal studies focusing on development and the group dynamics of computer mediated communication. The study was experimental and done using psychology students as subjects. ([JEMCO, 1993] and [JEMCO, 1996] I have also done a longitudinal study, but I have chosen more qualitative methods in order to explore and to capture the unexpected. We share the opinion that the history and the development of the group are important elements in studies of group. I have also used large parts of McGrath's extensive theory on groups. I will cover this later on in this chapter. When focusing on the

group dynamic aspects, I also share some goals with the research done on group support systems (GSS), but often GSS research focuses on the specific situations and often only on single sessions.

Lucy Suchman argues for the understanding of the context, the "situatedness of the phenomena and actions." While [Olson and Teasley, 1996] who studied the communication in a team of engineers by using interviews and observations, and then tailored support for their work, are open for the complexity and the contingency of communication tools use.

The work of Kraut, Egido, and Galegher on formal and informal communication in scientific research collaboration is a workplace study with similarities to my work. They look specifically at the importance of informal communication and discuss what the implications shall be for technology for collaborative work. ([Kraut et al., 1990a] and [Kraut et al., 1990b]) In the same book, [Finholt et al., 1990] reports on a study of seven groups using quantitative measures. They show that the groups frequently using email outperformed those that did not. They also test some hypotheses about how to overcome communication and coordination problems. But most interesting, they show how work changes in the groups using email, compared to the other groups.

[Harper, 1997] uses ethnography to study the work of the International Monetary Fund when going into a country asking for economic support. He demonstrates elegantly the power of ethnography in order to capture the rich context and the more hidden elements of interaction.

There is also done some research on media choice. The studies used as the basis for theory building are mostly based on interviews with a large number of managers. They all view media choice from the perspective of the individual, but open up for contextual factors. In the theory section I will use some of this work. Examples are [Short et al., 1976], [Trevino et al., 1990], and [Fulk et al., 1990].

[Williams, 1977] review 30 experimental comparisons of face to face and mediated communication. Already in 1977, a lot of research had been done on telecommunication and some on computer email and computer conferencing. Conflicts and cooperation, interpersonal perception, group dynamics, and non-verbal communication are areas reviewed. The work was primarily psychological, and it is interesting to note that this body of research is literally forgotten in today's research.

An interesting conceptual contribution is an "ecological framework" viewing team effectiveness as interdependent with team development, boundaries to the context and, and the organizational context. Key factors listed are organizational culture, technology and task design, mission clarity, autonomy, rewards, performance feedback, training/consultation, and physical environment. [Sundstrom et al., 1990]

## 4.2 Knowledge teamwork

What is 'knowledge teamwork'? It has something to do with work, this work is done in teams, and the work is focused around knowledge in some way. In this you understand that knowledge somehow must be created or transferred between the different team members. And right away you are far into the complicated discussion on data, information, and knowledge. And what is knowledge? I will not go into this discussion here, but I will refer to an interesting discussion of tacit knowledge based on the work of the Drilling & Well (B&B) unit in Statoil. [Sorensen, 1996]

[Laudon and Laudon, 1996, p. 571] write about information and knowledge work:

*"The U.S. Department of Labor defines as information workers all those people in the labor force who primarily create, work with, or disseminate information. Information work is work that consists primarily of creating or processing information. There are two commonly excepted types of information workers: knowledge workers (those who primarily create new information and knowledge) and data workers (who primarily use, process, or disseminate information). Thus, knowledge work refers to work that primarily creates new information or knowledge. Data work is work that involves the use, manipulation, or dissemination of information. [...] Knowledge and data workers can be distinguished by the amount of formal education required for them to be qualified to work in the field."*

They define a knowledge worker as someone who produces *new* information or knowledge. But they do not say anything about their distinction between information and knowledge. Is the editing of a lot of documents into a larger, but more comprehensive document knowledge work? (See also [Dahlbom and Mathiassen, 1993] for a dialectical approach to data, information, and knowledge.)

I agree that something new should be created in knowledge work. The definition used in this thesis is the following: *"Knowledge work is work which enables and results in an intellectual achievement of some creative and original kind, where former experience and knowledge is of importance to the result."*

Going on to the teamwork, I will define knowledge teamwork to be *"knowledge work done in cooperation with other people, where their joint effort causes the intellectual achievement to be different from what they would have accomplished alone."*

## 4.3 A discussion on concepts

This chapter would in a quantitative report be named 'Definitions'. I find it here more appropriate to discuss the various concepts used and to share my understanding of them.

### 4.3.1 Communication, support, and technology

I have already used a lot of words almost interchangeably: computer supported cooperative work (CSCW), computer-mediated communication (CMC), group decision support system (GDSS), technology support for teamwork, groupware, group support systems (GSS), and so on. I will not try to define all these, it is possible to find several definitions in the literature. What is interesting, is the commonalities of these words. They have all in common the fact that two or more people are involved. This is not a human-computer interaction. We are talking about human-human interaction, or a more used term: communication. This communication is not face to face, but mediated by some kind of technology or tools. It can be computers, or it can just be a telephone or pen and paper.

Now I have extended the scope of the concept I am trying to define. The words listed in the start of the last paragraph all have something to do with computers or technology. I try with 'technology-extended communication'. But this is not exactly what I am looking for. 'Tool-extended communication'? It is getting better, we can now include the pen and paper, but is the communication really extended? What about 'tool-mediated communication'? It is a clumsy expression, cold and "technology-like." But 'sustained communication' then? I find it in the dictionary: "*to support, hold, or bear up from below; bear the weight of.*" [House, 1992] It is an intuitive expression, it seems to carry the meaning I want.

Why leave behind the computer or technology focus? Why not use existing terms? By using the term 'sustained communication' the focus is on the communication and the fact that this communication is somehow supported by something and not only computers, but all sorts of tools for communication. This opens up for a wider perspective of study. Of course, after this we should also have a look at the words 'communication' and 'tool'.

### 4.3.2 Communication

Let us start with 'communication'. 'Communication' is used extensively in many different research areas, and there are more than just a few ways of defining the concept. I will not go deep into the discussion of definitions, and I will just provide a general and simple definition:



*"Communication takes place when one person with his or her behaviour somehow influences another person."*

Behaviour includes here all possible conscious and unconscious human actions. (See [Rommetveit and Blakar, 1979] for a detailed coverage of communication.)

### 4.3.3 Tool

It may seem that I use 'tool' and 'medium' interchangeably. I do not, but I will explain. A medium is often used, and a list of media can include: newspapers, television, radio, telephone, letter, email, and so on. But we soon get a problem: Is it a difference between a telephone and audio capabilities of a computer application? Is there such a thing as "the electronic medium"? Or do you have to differ between different types of communication through computers like conferencing, video-conferencing, shared databases, application sharing? When you start an application with application sharing, audio and video capabilities, do you use one medium or several media?

Some times it makes sense to talk about a medium. When just studying email, telephone and formal and informal face to face meetings, you have no need for a more specific concept. But can you say that a formal and an informal meeting are two different media? Probably not. You also get a problem when the email can be used in different ways, or as in the example above, a computer application supports different types of communication. To avoid this problem, I use the word 'tool' when a more specific word is needed. *"A tool includes the medium in use, and the mode and the specific facets of it."* Defined this way, a tool can be a formal or informal email message, a bulletin board, a text conference system, an audio/video conferencing system, application sharing, a "drop-by" conversation, a formal face to face meeting, a formal letter, an informal letter, etc. This way the application in the example above consists of several tools. It is an instrumental view, as a communicator you may think: I want to get this message through, and I want it to be formal, but not official, and I need the receiver to get a positive feeling when receiving it. Which *tool* shall I use? (See [McGrath and Hollingshead, 1994, p. 114] and [Kraut et al., 1990b, p. 146] who use 'tool' in similar ways.)

### 4.3.4 Group

Another word often used in this report, is 'group'. What is a group? What is a team? And what types of groups are there?

[Forsyth, 1990, pp. 7-8] lists eight different ways of defining a group, and that is just a small collection. As I have used Joseph McGrath's theory of groups a lot, I will also use his definition of a group.[McGrath, 1984, pp. 8-9] He defines a group as a "fuzzy set", i.e. he does not try to set some categorical boundaries, but rather tries to specify certain features that make a group. He starts the definition by stating that "*a group is an aggregation of two or more people who are to some degree in dynamic interrelation with one another.*" The continuation is interesting as he instead of setting boundaries, defines what will reduce the "groupness" of the group:

*"(a) the number of its members increases, and/or there are barriers to mutual awareness and interaction; (b) the range of content of the members' interaction decreases, and/or there are barriers to free interaction; and (c) the members' "history" decreases, and their anticipated "future" shrinks toward the time-bounds of the current interaction."*

Coming to the different types of group, [Argote and McGrath, 1993, pp. 339-340] classify groups in organizations according to how they come into life. One way is when the organization has a specific problem and then assigns people to a project which is responsible for acquiring or creating the tools, rules, and resources for the project's work. This establishes a **task force** and it is temporary in order to solve this specific problem. A **team** is formed by the organization recruiting people with specific skills and provide them with the appropriate tools, rules, and resources in order to deal with a certain group of problems. Other times the organization acquires a complex set of tools, for example a new administration computer system, and then recruits people to be a **crew** for that technology.

Except that in my case study the project was established by the group itself and not by the organization, the project I followed resembles the 'task force'. But if the 'organization' is widely interpreted, this difference disappears. In this paper I will use 'team' and 'project team' to mean the same, and in the way Argote and McGrath use 'task force'. This is acceptable as I do not need to differ between different groups.

### 4.3.5 Communication pattern

In chapter 1.4 I write: "*A communication pattern shows how topics, messages and intentions are being communicated using email, databases, telephone, meetings and so on. The pattern tells us about who uses what kind of communication tool for which kind of message, and to whom.*"

I could here go into a lengthy discussion in order to give a more general and precise definition. But I will just note the following points that can be taken as a

definition, but is not: A specific communication pattern is a stream of single, inter-related communication acts. A description of a communication pattern includes information about task, situation, context and/or other factors. A general communication pattern is an aggregated distribution of communication acts according to task, situation, context and/or other factors.

#### 4.3.6 Communication, cooperation, and collaboration: and what about coordination?

The terms communication, cooperation, and collaboration are often used without defining them or relating them to each other. I have defined communication earlier in this section, but what can be said about cooperation and collaboration?

Let us use our common sense and start with 'collaboration'. Random House Webster's dictionary defines 'to collaborate' as: "*to work, one with another; cooperate, as on a literary work.*" Is cooperation and collaboration the same then? Webster's says this about 'to cooperate': "*to work or act together or jointly for a common purpose or benefit.*" Does this help?

When reading "to work one with another as on a literary work" I see two persons sitting together, one with pens and paper, while they discuss, read, listen to each other and create something, and no part of it can be said to be done completely by one of them. I get no such pictures by the definition of 'to cooperate'.

I will therefore conclude this investigation into our common sense with the following definitions: "*to collaborate is to jointly work with one another in a continuous interaction that can not be replaced by individual work*" and "*to cooperate is to work or act together for a common purpose or benefit.*"

These definitions mean that collaboration is a subset of cooperation, and can, but not necessary, be a part of a specific cooperation. But what is coordination? Malone and Crowston discuss this concept, and start out with a "common sense" definition: "*the act of working together harmoniously.*" After our discussion above, we can substitute 'working together' with 'cooperating'. After a discussion they come to the following narrow definition: "*the act of managing interdependencies between activities performed to achieve a goal.*" [Malone and Crowston, 1990] Or with other words: the extra, non-productive work you must do in order to cooperate successfully.

It is useful to differentiate between these four concepts as the discussion above make visible, the act of communicating, cooperating, collaborating, and coordinating using technology are all quite different things. They are of course interrelated, but in an analysis it is important to be aware of these distinctions.

### 4.3.7 Other concepts

I will just use 'task' informally as a description of an activity with either an implicit or explicit goal.

This thesis is about communication patterns in a dispersed group, and how communication tool decisions are made. Implicit in this, there is a belief that some communication tool decisions can be ranged as better or more efficient than others. I agree with this belief, but the goal of this work is not to find the "smartest decisions", and I will therefore not define this "betterness" or "efficiency".

## 4.4 The research framework

### 4.4.1 A framework?

Even though you are doing an exploratory study, you will always have some expectations and simple theories about what you are going to find. You also need some kind of guidance to know where to look and what to look for. A framework can also be of help when you are analysing the empirical data. There are a difference between a research framework or model and a theoretical model. A research framework is created to make explicit your thoughts about the substantive domain, and to guide you in your research design and implementation. On the other hand, a theoretical model is created to conceptualize and visualize the empirical findings. A model can be 'local', that is, made only to describe a specific case, or it can be 'general', which is what we normally think of when we hear the word 'model'. Such a model generalizes the relationships between the different entities of the substantive domain and it should be scientifically testable.

### 4.4.2 The initial framework: TAM

While discussing the process of developing the research questions in chapter 3.1.2, I wrote that I early in the data gathering phase created a simple research framework. This framework consisted of the four elements I found the most important. These were: the group who is doing the work, the different tasks its members are doing, the tools or media they have access to, and encapsulating these three: the organizational context. I named the framework the 'Teamwork Adaptation Model' (TAM), as the thought of reciprocal adaptation is central. (See figure 4.1)

The framework captures several of my thoughts. First of all, it suggests that the tools, the tasks, and the group do not exist alone. There is an interaction between the characteristics of the group, the different types of tasks, and the types and modes of the tools. This means that any one of these three cannot be studied in a vacuum, nor only two. When studying these inter-connected elements, you

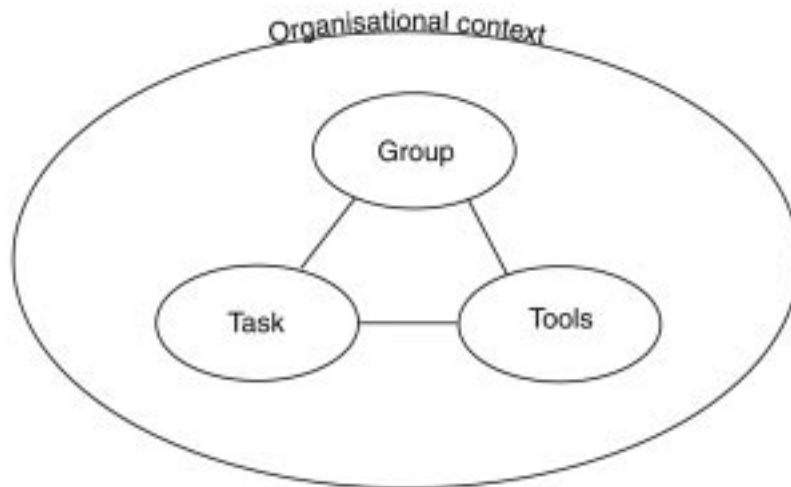


Figure 4.1: The TAM framework.

must also consider the organizational context, the culture, the norms, history, and so on. Taken to the extreme, this means that it is not possible to create a complete system of communication tools without taking into consideration the characteristics of the group(s) which will use the system, the tasks they shall accomplish, and the organization they are in. [Olson et al., 1993, p. 121] argue: *"Determining what type of group technology will be successful depends heavily on specifying all four of these aspects: the global situation (implied in asynchronous versus synchronous work), the task, the technology or media, and the group composition."*

The framework helped me to identify the larger elements of what I was studying, and enabled me to break these elements into smaller and more concrete components. I tried to find as many components as possible. The group had roles, relationships between the members, power allocation, cohesion, communication network, the individuals had several components as hidden agendas, motives, and so on. The same I did with the three other elements. This way I got variables possible to study and "say something about." It was also possible to single out the most important and try to figure out the connections and interactions between them. The framework was of good help to organize things in the beginning.

#### 4.4.3 A more detailed framework

Of course, the framework was very wide, and not very useful when I started to get into the details of the analysis. After finishing the observations and some of the initial analysis, I found a research framework created by McGrath and Holling-

sheed. [McGrath and Hollingshead, 1994, p. 95]<sup>4</sup> In their book, *Groups Interacting With Technology*, they have done an excellent review of conceptual and empirical contributions to the knowledge of groups interacting with technology. The fields of CMC, CSCW, social psychology, and management science are included. They have also tried to integrate the different empirical findings, aggregating, and trying to draw conclusions. They write in the conclusion:

*”It is apparent that any generalization one might make from these results is very shaky. Whereas each individual study may be methodologically strong and sound (many are, some are not!), the body of literature as a whole is burdened with a triple or quadruple confounding of communication system, task type, and research strategy. Furthermore, the literature virtually ignores all group and member variables. Finally, there is a wide variation in dependent variables, and they tend to cluster within the confounded task-media-strategy clusters.”* [McGrath and Hollingshead, 1994, p. 91-92]

First of all, I found here additional support for my view that the group-task-tools dimension was not well enough understood. Second, their framework enabled me to organize the different variables more systematically. Where my framework is general, this framework is detailed.

This framework was meant to be a help for getting research more suited for aggregation, but it is also a help to identify what you are studying, and maybe most important, what you are excluding from the study. (See figure 4.2) But I still find it helpful to use the simpler, original framework to remember ”what this is really about.”

The different aspects of the framework are categorized according to four classes: input factors, organizing concepts, process variables, and outcome factors. We see here that if this had been a theoretical model, the linearity of the model could be criticized. This had been more important if it was a theoretical model, but a more circular perspective could have been useful.

In each of the four different classes, you find groups of variables to study. The input factors are relatively stable, and form the basis for the observation. A circular framework had also been able to capture the fact that the input factors are continuously changing as a result of the other variables. The organizing concepts are different perspectives the group can be viewed from. The process variables are observable factors while the group is interacting, while the outcome factors can be measured at the same time or afterwards.

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<sup>4</sup>See also [Kraemer and Pinsonneault, 1990, p. 378] for a similar framework.

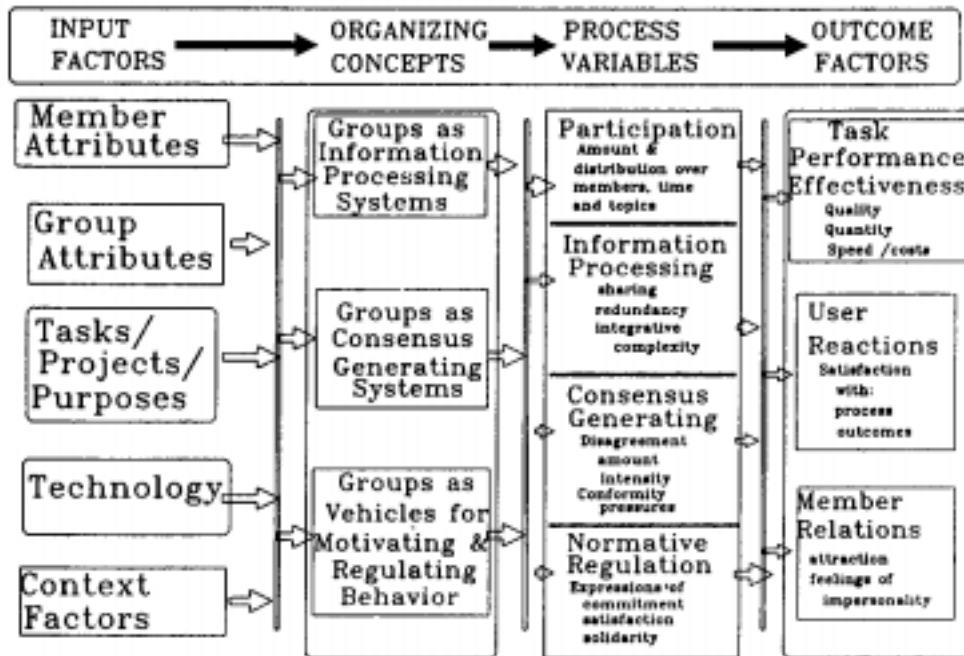


Figure 4.2: The research framework.

I used this framework to organize my earlier components or variables. This list of variables sorted according to McGrath and Hollingsheads' framework is listed in the appendix C.

#### 4.4.4 The progress in the CSCW area

As McGrath and Hollingshead argued, generalization is difficult and a broader perspective should be taken, taking more variables into account. [Olson et al., 1993] have a stage view of how the human-computer interaction (HCI) field has developed:

1. Exploratory Design or Point Systems
2. Dimensions of Design Space
3. Characterization
4. Articulation of Laws of Behaviour

They argued in 1993 that the field of CSCW was still mostly on the first stage, the 'exploratory design or point systems' stage. The point systems stage is a period where test systems are created in order to understand some of the basic variables of the domain. What McGrath and Hollingshead are trying to do, is to draw the dimensions of the design space or to aggregate the findings from the point systems. This was in 1994 and they argued that it was difficult. Do we still have to build point systems and do exploratory studies? We now write 1998, and four years have passed. Have we not left stage one? A look at the proceedings of the last CSCW conference, disconfirms this. Almost all of the articles are either point systems or exploratory. Some of the dimensions have been mapped, and some attempts to understand the dimensions have been made. But this has not been done systematically, and sadly enough, I cannot find any attempts of addressing the problems of aggregation of findings that McGrath and Hollingshead noted in 1994.

## 4.5 Time, Interaction, and Performance (TIP theory)

The theory of time, interaction, and performance is very comprehensive, and there is a lot to discuss if the theory should be completely covered. I have here chosen to present only the parts that are interesting to use to cast light on the empirical data, without thoroughly discussing the whole theory. Though, the most important parts are covered. Everything found in this section has been adopted from the following works (listed in the order of relevance): [McGrath, 1990], [McGrath, 1984], [McGrath and Hollingshead, 1994], and [Argote and McGrath, 1993].

McGrath's TIP theory is one of several theories of groups. Why then, choose TIP? As already said, it is comprehensive, but it also focuses on several important factors when studying real-life groups: The group is not seen as a separate entity, but as a part of a context. The group is seen as a dynamic, ever changing system. The group is seen as an arena for also other functions than just production. And the theory is a useful model for the conceptualization of a large number of factors of group functioning.

In my qualitative studies, I have not followed any one theory fully, but I found McGrath's TIP theory to be the most appropriate for my use. I also used other sources and the empirical data as an inspiration for further analysis. This pragmatic approach is possible when theory is just used as a guide in an exploratory study. This means that I have not seen TIP theory as the "truth", but rather as a tool for analysis and exploration.

The basic TIP theory consists of a task typology, three functions of the group,



four different phases of development in the group, and the concepts of nesting and coupling. In the section on analysis in the last chapter, I referred to McGrath's typology because I used it as a tool when coding email messages; you will now get the details.

### 4.5.1 Task typology

When analysing group work, it is extremely useful to have a typology of tasks as a help. No matter how you do it, you will need some kind of classification of the tasks done. I used the empirical data and McGrath's task typology to complement each other.

The task circumplex can be seen in figure 4.3. Four different classes of tasks can be found on the circumplex: generating tasks, choosing tasks, negotiating tasks, and execution tasks. The generate class in quadrant I can be brain-storming, agenda-setting, idea-generation, and so on. The two sub-classes are the planning tasks and the creativity tasks.

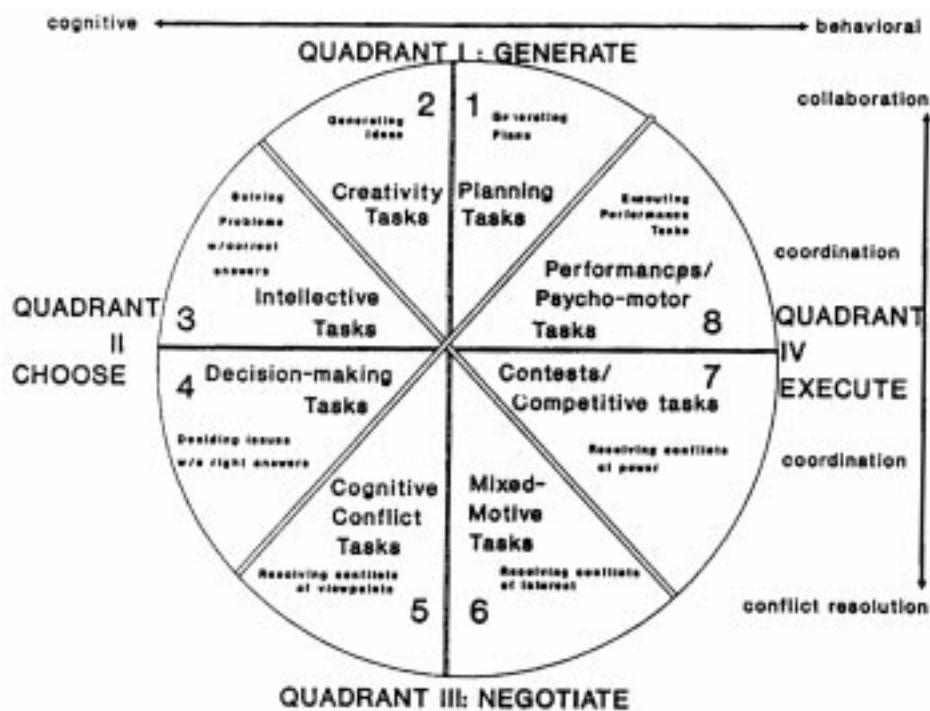


Figure 4.3: The task circumplex.

The quadrant II, choose, consists of intellecive tasks and decision-making tasks. The intellecive tasks are problem solving tasks where there are correct

answers, while in decision-making tasks there are no correct answers.

The quadrant III, negotiate, includes cognitive conflict tasks and mixed-motive tasks. A cognitive conflict task is about resolving a conflict of viewpoint where two or more people have different views on a certain matter. On the other hand, a conflict of interest can be more difficult to resolve, as often both parties cannot be satisfied. This task is also often called bargaining, but it is here called a mixed-motive task.

In the last quadrant, execute, we find two tasks which share in common the often required coordination among the members of the group. The performance/psychomotor tasks include mostly physical coordination, while contests/competitive tasks require another less visible form of coordination. Here is also where the conflicts of power come to play.

The two axes on the figure is one from cognitive to behavioural tasks, and one from collaborative tasks to conflict resolution. These axes must be seen in relation to the fact that the actual tasks can fit more or less to each task type in the circumplex. This way they make up a continuum.

It is wrong to say that this task typology is complete. While coding the email messages, I found that the Execute-Performance task had to be slightly redefined in order to fit all the task types I found. (See appendix B) And what we would call social interaction has no space in the task circumplex. Another typology I could have used either instead or complementary, is Steiner's model of task types which relates the input of the individual to the outcome of the group. He used two dimensions: divisible versus unitary and maximising versus optimising. He had five different task types: disjunctive, additive, compensatory, conjunctive, and discretionary. As an example, an additive task is a task where the inputs of the individuals get added. [Forsyth, 1990] Another alternative is Hackman's work, who classified the tasks into three, and along six dimensions. [McGrath, 1984, p. 56] This work is similar to McGrath's.

### 4.5.2 Three functions

TIP sees groups as fulfilling three functions at the same time. When the group do things, contributions are made to these three functions. The contributions can be to the group's embedding system, which is the production of something, and here called the production function. The group's contributions to its component parts, the individuals, are called the member support function, and the contribution to the group itself is called the group's well-being function. This means that when assessing the group's success, you must not only look at what they have produced, but also what the group has invested in member-support and the group's well-being. Giving proper attention to these two functions is crucial for the group's continued functioning.

Phases:	Functions		
	Production	Well-being	Member support
Inception	Production demand/ opportunity	Interaction demand/ opportunity	Inclusion demand/ opportunity
Problem solving	Technical problem solving	Role network definition	Position/status attainments
Conflict resolution	Policy conflict resolution	Power/payoff distribution	Contribution/payoff relationships
Execution	Performance	Interaction	Participation

Table 4.1: Group function foci

Steiner, who measured the individuals' added input and the common output, named the discrepancy between input and output as 'process losses'. When doing psycho-motoric tasks, this loss because of coordination may well be called a loss. But in a group working on intellectual tasks where continued and long-term cooperation is needed, the name 'process losses' used to characterize the time needed for member-support and the group's well-being is clearly misleading.

### 4.5.3 Four phases

While these functions are all at work at the same time, the weighting between them and the aspects of the functions in focus differ according to the development of the group. McGrath introduces four stages of group development, but as he also shows that groups can move circularly between the stages, the theory does not satisfy the criteria for stage-theories in developmental psychology. I therefore find it more appropriate to say that groups move between four different **phases**.

- Phase I involves inception and acceptance of a project, determining goals. (**inception**)
- Phase II involves the solution of technical issues and planning. (**problem solving**)
- Phase III involves resolution of conflict. (**conflict resolution**)
- Phase IV involves execution of the performance requirements. (**execution**)

For each phase, the foci of the different group functions are shown in figure 4.1. The figure should be read this way: For each phase on the left hand side, the row describes the purpose of the phase organized according to the group functions.

McGrath describes three main paths going between the different phases. The paths can be described as going between the different phases, or with a focus on a function, between the different purposes of each phase with respect to a function. This can be seen in figure 4.4.

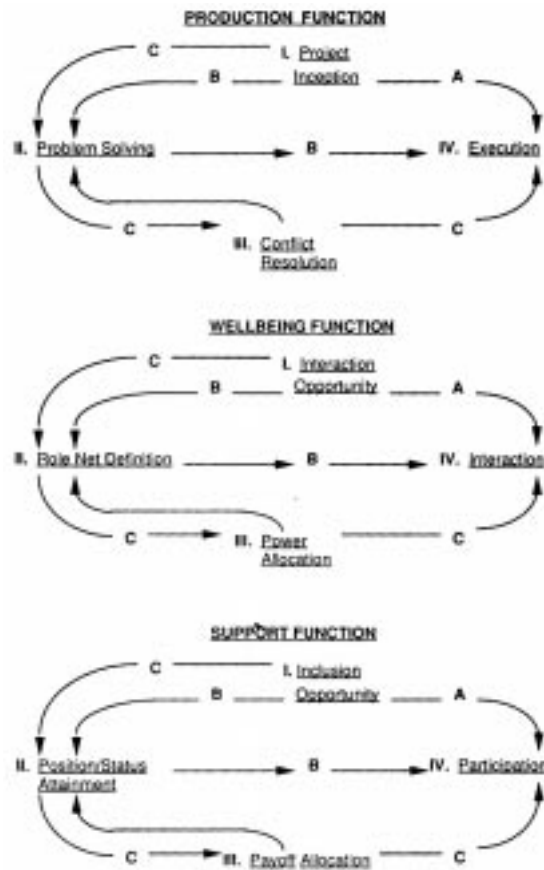


Figure 4.4: The three main paths.

These functions and the different phases can be used as a tool for dividing data from group observation into separate areas, and this way gain an understanding of the underlying processes and relationships.

#### 4.5.4 Nesting and coupling

With the concepts of nesting and coupling, the group's context is brought closer to the groups work and functions. Nesting refers to the fact that a group member is also always a member of another groups; the larger organization, another project

group, the soccer team, and so on. This nesting has of course consequences for the group's functioning and work.

Coupling refers to the casual relationships between different parts of a system. You can have tight coupling, a direct casual relationship, or loose coupling, which consists of indirect and complex casual relationships. [McGrath, 1990, p. 29] says about coupling:

*"Here, I postulate that most work groups are loosely coupled systems in two senses: (1) The actions of individual group members are loosely coupled to one another; and (b) the behavior of the group as a unit is loosely coupled to the larger social units within which the group is embedded."*

Often groups are seen as closed systems. These two concepts change this.

#### 4.5.5 The organizational context

As I have written earlier, a lot of scholars have concentrated on the context. Many of these are what has been called 'adoption studies'. [Orlikowski, 1992]'s study of Lotus Notes is probably the most known. (See [Olsen, 1997] for a study of the adoption of Lotus Notes in Statoil.) But most often the underlying group dynamics are not visible. In this study I focus primarily on the group, but seen in the lights of the organizational context. This is why nesting and coupling are useful concepts.

But even if TIP theory has the group as its focal point, an extension of it see how groups exist in the organizational context. That is, turning now to view the group from an organizational perspective, instead of seeing the organization in a group perspective.

I have in the section on concepts earlier in this chapter discussed the definition of a group, and different types of groups. Argote and McGrath's suggestion is three types: task force, team, and a crew. They define these groups according to how they come into existence. Here I will describe the four sets of processes they claim describe how work groups in organizations "come into existence, develop and maintain themselves; do their work; have an impact on (i.e. change) themselves and the rest of the organization and environment; and stay connected to the organization of which they are a part." [Argote and McGrath, 1993, p. 340]

The four sets of processes are the construction processes, the operations processes, the reconstruction processes, and the external relations processes. The construction processes are the processes involved in the start-up of a group's work. This is "the recruitment and socialization (training) of people; the acquisition and

*adaptation of tools/technology; and the establishment and elaboration of purposes.*" (p. 340-341) In the operations processes, the TIP theory presented earlier describes the processes going on.

The reconstruction processes concern the modifications of people, tools, and purposes as a result of having done the project. Though both continuous, these processes are different from the change processes in the group in order to get the work done. The reconstruction processes are compared to what is called organizational learning in the organizational development literature. Argote and McGrath call it "embedding knowledge" in people, tools and purposes, plans, and procedures.

The external relations processes refer to the group's monitoring and management of its relations to the organizational and environmental context. These external relations can be to managers and supervisor, to outside sources needed by the group, or the monitoring of potential values or threats to the group.

Each group in the organization, even the organization itself can be seen in the lights of this model. As an example, the external relations processes to a group can be part of the operations processes of the larger organization.

These aspects of the TIP theory: the task typology, the group functions, the phases, nesting and coupling, and the group seen in the perspective of the larger context build a comprehensive framework for the understanding of groups. In my case, I used actively the task typology in my analysis, but used TIP theory only as one of many theoretical inputs for inspiration in the analysis. In chapter 8, Theory Discussion, I will use TIP theory to try to understand some of the findings.

## 4.6 The Task-Medium Fit

There are a lot of existing tools supporting work groups. These tools range from email systems and databases, to telephone, and brainstorming techniques like the nominal group technique. A part of the mission to support group work the best possible way, is to determine when the different tools are suitable and when they are not. This is a complex task, but understanding the underlying factors of the use of sustained communication would be a great help in order to later create normative models which can guide us when we ask: How shall I choose the appropriate tool for a specific task, message, or situation?

In [McGrath and Hollingshead, 1994, p. 108-112] we can find the notion of a fit between task and medium. They are lending the concept of 'information richness' from Daft and colleagues. Information richness is the capability of a certain medium to transfer information of variable types. That is, face to face is a very information rich medium, as you can use all your senses to extract information

about the situation. On the other hand, a letter is low on information richness, due to the lack of information except from the words themselves.

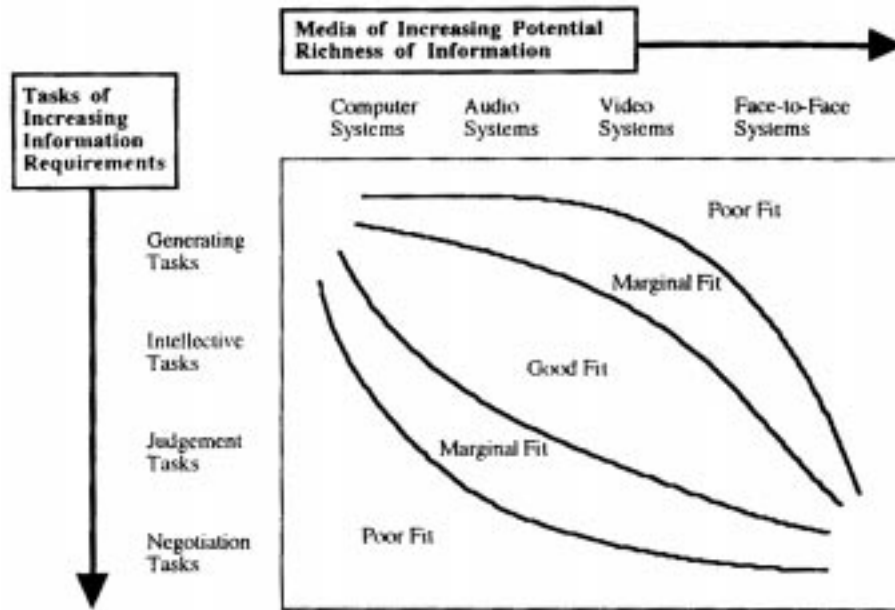


Figure 4.5: The task-medium fit.

As seen in figure 4.5, the model is using information richness and different tasks from the McGrath's task typology, McGrath and Hollingshead have created a simple model for when the different media is appropriate for a certain task. This model, originally meant for analysing group support systems, explains why these systems have been a success for brainstorming tasks. The reason is that the information richness of face to face work is too high for brainstorming, and therefore interferes with the task, namely generating ideas. The model also provides a new way of looking at video-conferencing and why it have not become the success it was expected to be. The lack of success can be explained by stating that video-conferencing is not higher on the information richness scale then telephone, despite its video windows. Recent research confirms this, and some research suggests that video-conferencing may be useful in specific situations, for example when the two conference attendees have different language abilities, i.e. one native and one non-native English speaking person. [Williams, 1997]

This way of thinking about task-medium fit closely resembles the thoughts of my own TAM model (chapter 4.4). I therefore find this concept to be promising for explaining the connections between task and media. The task-medium fit will be re-visited in the later empirical and theory discussions.

# Chapter 5

## The Organizational Context

*In this chapter on the organizational context, I will present some general information about Statoil, just to introduce you to the corporation. Next, I will describe the large organism which all projects in Statoil live in. It is important to have background information on this when we come to the actual description of the project's organization. The organizational structure, the intermix of people and projects, the "governing documentation", and the "account-string" are important aspects of a project's life.*

*The information infrastructure and the communication tools available and how available they were, are important because this will largely influence both the project and its members. In order to understand the larger context that a project exists in, I will review the rules a project and the members must follow and the support they have available.*

### 5.1 Statoil, the organization

*"Den norske stats oljeselskap a.s– Statoil - was founded in 1972 and is wholly owned by the Norwegian state. Its corporate object is, either alone or through participation with other companies, to carry on exploration, production, transport, refining and marketing of petroleum and petroleum derived products, as well as other business." [Statoil, 1996]*

#### 5.1.1 General

The overall operating revenues for 1997 was NOK 124,726 million. This is about 16,200 million dollars. The number of employees was more than 17,000, with an



addition of about 15,000 hired consultants. Statoil was also in 1997 represented in 25 countries throughout the world. [Statoil, 1997]

Already in 1994, Lotus Notes was installed as a corporate wide system, and the program called "Three steps forward to a new millennium" illustrates the focus on information technology as a tool for enhancing the expertise in the company: All employees in Statoil got in 1997 the offer of receiving a free multimedia home computer with Internet access. The demand was that they had to go through an extensive training program. As all corporate documents could be found in Lotus Notes databases, even some that only existed in the databases, direct Statoil Notes access was prepared for those who voluntarily wanted it. This free home PC project is known as the IT step, and served as an inspiration for several other companies in Norway.

### 5.1.2 Organizational structure

Statoil was organized with an executive board with a president on the top, and fifteen divisions, or result areas (RO in Norwegian) building the organization. At the time of the observations, ten corporate staff functions supported the executive board and the organization with functions such as human resources, legal affairs, and corporate strategy development. Most of the result areas consist of several result units (RE). Troll project (TRO), a platform in operation, is one example in the result area Natural Gas Production and Transport (GPT). Each result area has also staff functions. A result unit may have the responsibility for a platform (as Troll) or a plant, or a function as Drilling & Well Technology (B&B).

Each result unit may be organized according to different structures like a hierarchy or a network. So, a result unit will have several departments, some primary departments and some support departments. Using the Troll project, they had a department called production (PRO). This gives you the correct name of the department: GPT-TRO-PRO. (See figure 5.1) And as some types of departments or support units are likely to be the same in different result units and result areas, you may end with equal names of different organizational units. One example is GPT-TRO-B&B and LUN-B&B. But the full name will always be unique.<sup>1</sup>

All these different organizations within the Statoil organization is mixed together as the result units' different functions often have "mother organizations" in a different part of the organization. This means that alongside the main organizational structure, you will find a separate organizational structure for the functions

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<sup>1</sup>This description is of the Statoil organisation at the time of my observations. The main organisation was changed three times just during the three months observation period. I here present the "middle one." Statoil is known for its frequent changes in organisational structure, which obviously complicates the picture of the organisation.

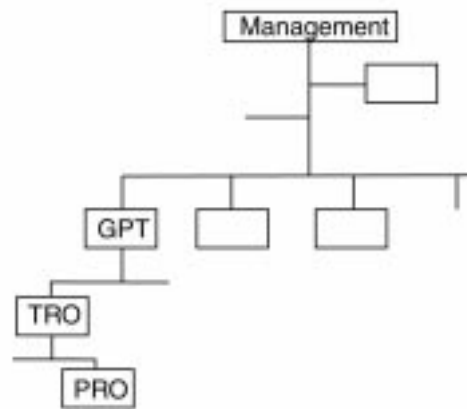


Figure 5.1: An outline of the GPT-TRO-PRO organization.

of these units. One example of this is the IT department of Research & Development (R&D) which in addition to being a part of the R&D result area, also is a part of the Data result area. Actually, you *can* refer to same department with two different codes. And a list of Statoil organizational departments is more than eleven pages long, about 740 departments!

Another thing that mixes the organizations is job rotation which is extensively used in Statoil. This job rotation can be in the form of changing a position, or that a person is hired by another part of the organization as an "internal" consultant.

### 5.1.3 Governing documentation and the "account-string"

Another important structure in the Statoil system, is the governing documentation. On the top you have Demands & Procedures (KP), which is common for the whole organization. Below there is a hierarchy of rules. The lower down in the hierarchy you get, the more specific and closer to the daily work are the rules. All this documentation exists in Lotus Notes databases, and as all employees have their own Windows based PC in their offices, it is available to all. The hierarchy of rules makes it possible to create a Troll, Norne, or Aasgard way of doing things.

All Statoil employees charge the hours they work, and other expenses, on different projects. These projects may exist on different levels, and a project can consist of subprojects without working as several projects, as each organizational unit will create a new project within that unit for each project they are connected with. The charging is done by using something called an "account-string", or for short a "string." This account string identifies the unit, the year, and the project number within that unit, project type and so on. Most often, when an agreement

has been reached, money is transferred from one string to another string. Anyway, you can only charge strings you have budget responsibility for, or you have been authorised to use.

With this short introduction to the organization of a large company, it should be possible to appreciate the position of a project in Statoil.

## 5.2 The project in the Statoil organism

The organizational structure described in the last section opens up for an internal market with personnel, services, and products. Actually, Statoil Data is for example seen as a organization within the organization, and each unit is free to evaluate and instead choose external companies as suppliers or consultants in areas where Data can deliver products. The simplicity of the internal market and the accounting give of course Data a competitive advantage. In the description below of projects' life circumstances, I have made some simplifications. I have tried not to complicate the picture needed for the understanding of the case.

Every part or parts of the organization may start a project with goals of their choice. Small projects within one unit or department are started and ended all the time. The process is pretty simple, the management at the nearest level supports the project's start, some internal funding is found, people are allocated to the project, and the project is a fact. Projects growing, or starting as cross-organizational projects need support from management in all the organizational areas the project touches. Enterprise projects need the acceptance of the enterprise management.

Informally, we can classify the projects in Statoil into four: departmental projects, inter-departmental projects, enterprise acknowledged projects, and 'moonshine projects'. 'Moonshine projects' needs an explanation: The term is borrowed from one of the project members in my case, as a name for the project's type. A 'moonshine project' is a project intended to be cross-departmental, but which is started without the support from management in more than one organizational unit. The project then tries to find "allies" and possible partners or members of the project. These allies or members can be single persons or an organizational unit or external partners. With the initial management support comes also funding for this first process, and maybe the allies contribute with some funding. At the same time, customers for the project's deliveries are sought.<sup>2</sup> That is, in order to survive, the project must find sources for the funding of the "real" activities, the activities actually producing the deliveries. It cannot live on the basic funding alone.

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<sup>2</sup>Moonshine projects' have always some sort of product.

As the project grows, it more and more becomes an inter-departmental project, and if the project exists long enough, or grows to be large enough, someone in top management needs to analyse the project, and decide whether to give it the status of an enterprise acknowledged project, let it alone, or to "kill it."<sup>3</sup> Of course, becoming an enterprise acknowledged project has implications for funding, project control needed, and the striking power in the organization.

Projects are often started as a solution to a experienced problem or lack of something. Small projects can live their lives and die protected by the organizational barriers. Few people outside know about it. Although the information about the project can be found somewhere, it is highly likely that someone who can benefit from knowing about it, do not. Most of this sort of information goes through informal networks. Unofficially, I was told that Statoil had about 3,000 different computer software systems and about 9,000 different Lotus Notes databases. (Of course, personal email databases are excepted) This huge amount of information is not structured anyway except according to organizational structure. And even though it is almost for sure that you can find information about any project in Statoil through Lotus Notes, the only way to be sure you have not missed anything is to go through all of the databases connected with each organizational unit. Or the more often used way, by querying the informal networks you have.

This means that several projects working on the same problems can co-exist in different parts of the organization. The informal networks will in a relative short time inform the projects about each other. But even though they know about each other, there are no incentives or rules that will cause these projects to cooperate or even exchange information. This situation with few rules controlling the inter-departmental or inter-unit relations and the parallel hierarchical structures create a fertile soil for politics as a method for control, influence, and power.

As I have spent so much space to explain about 'moonshine projects', there is probably not a surprise that the project in my case study is just such a project.

In addition to the organizational context described here, all members of projects have to relate to the infrastructure they have available for their work.

## **5.3 Contact possibilities across time and space**

### **5.3.1 Infrastructure**

Statoil has a computer network with the possibility for all employees to log in at all Statoil locations and get their personal programs, stored files, and email. Files can also be shared in common disk areas, though only between people at the

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<sup>3</sup>Statoil jargon.

same location. The web infrastructure is not yet fully developed, and most of the information found there has a "homepage" character. I.e. informal, casual and often not satisfactory.<sup>4</sup> The main information infrastructure in Statoil is based on Lotus Notes, and all employees use Notes mail as a part of their daily work. In addition there exist a myriad of software packages in three main categories: Enterprise wide, standard applications (like Lotus SmartSuite, viewers, tools, web browser,...), enterprise wide, on request applications (like web editors, administrative software,...), and local applications (specific applications for a unit). Only the enterprise wide, common applications are a part of being employed. Your department have to pay a fee for the deliverance and support of other types of software.

Most users have the enterprise wide applications and probably some which are specific for the result area or the result unit they are in. If they also do specific things, like graphics manipulation or software development, they or their department has "applied for access" to the appropriate types of applications. In addition, you can of course buy software separately and install it locally on your own computer. But it will be accessible only on your computer, and you can assume that few others have the same software.

The consequence of this system, though very convenient when travelling or changing computer, is that the applications in the enterprise wide group strongly influence how it is possible to cooperate using computers. Lotus Notes is therefore the primary way of exchanging information.<sup>5</sup>

### 5.3.2 Communication tools

#### Lotus Notes

*"The Power of People Working together"* is written on the outside of their documentation. Lotus Notes is known as a groupware system, or a system for cooperative work. Basically, Notes consists of a lot of documents. The documents can be of any type: internally supported by Notes, like formatted text, and pictures, or external documents of any type supported by Windows, represented in Notes with a clickable symbol. Related to the documents you can store dates, numbers, or other text information. The documents are ordered in groups, each group is

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<sup>4</sup>A project called 'Information sharing' released 1 July, 1998 a more common framework for the intranet called 'Eureka'. There is a tendency that more and more of the data earlier found in Lotus Notes databases, now can be found on the web-based intranet through Lotus Domino. But still, all the changes of data are done in Notes.

<sup>5</sup>Microsoft NetMeeting just became an enterprise wide standard for application sharing. The telephone is still used for speech.

called a database.<sup>6</sup> Around a database you can create different standard ways of viewing your documents, a set of actions made to deal with them, menu pages, and so on.

There is probably nothing you can do in Notes that you cannot do in more traditional database systems like Oracle, but two things differ: the simplicity in Notes of creating new databases, views, and actions, and the way Notes handles a large amount of users situated at different location. Notes has strong mechanisms for copying the databases from one machine to another, while you still are able to change something one place, because Notes will let the changes propagate to other machines. In addition, you do not work with the databases on your machine, but on a centrally located machine. This has made Lotus Notes the single most used system for document sharing.<sup>7</sup>

Statoil has, as I referred to earlier, about 9,000 databases. Estimating how many of these are in daily use, is difficult, probably at least a few thousand. There are different types of databases, most of them are specifically created for Statoil by the Data group. There are some common databases, like the databases with enterprise wide documentation. They are referred to with names, like "It is all found in DELTA", STID, and so on.<sup>8</sup> Others are referred to with their type name and a specification of what is referred to, like: "my Notes mail" and "you will find it in the KOT ESOP database." (KOT is the organizational unit, ESOP a name for a certain type of Notes database)

In Statoil Notes you will find the personnel handbook, the forms for business card or computer equipment orders, services like moving, cleaning etc., "report on unwanted occurrence", Statoil enterprise presentations, and so on. Actually, everything not in its own separate application, and not too large or too graphical to be stored on computers, will be expected to exist in the Notes database. Interestingly though, when people do not find what they are looking for in a domain outside their own, they most often think they have not found it, instead of concluding that it is not there. A saying in Statoil describes this: *"If Statoil knew what Statoil knows, Statoil would have been a very knowledgable company."*

The person who creates a database has the authority to do changes to the database and decide who has access, while the others can just retrieve the informa-

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<sup>6</sup>Which of course is different from a relational database, for those who are familiar with this concept.

<sup>7</sup>Being fair to Lotus Notes; I have here only described the functionality in use in Statoil at the time of the observations. About that time Lotus came with Lotus Domino, which makes it possible to view Notes databases using a web browser. Other type of functionality has also been included, but the focus on documents is prevalent.

<sup>8</sup>An interesting thing about Statoil is that all the organisational units have three letter shortcuts, Notes databases and applications have longer shortcuts, but they are all acronyms. The number of acronyms in Statoil must be enormous.

tion. Which database you have access to read or not, seems a bit random, though most of the databases are open for everybody to read. The primary metaphor for Notes is a large "filing cabinet." During my many hours of "surfing" in the Statoil databases, I found very few discussion databases.<sup>9</sup> According to the Data group, such a database is easy to create. As one of my respondents phrased it: *"We should have had a discussion database. It is easy to create, I could have done it. It just never became that way."*

#### **Notes mail**

The Statoil version of Notes mail is equal to the original, but with some additional views, as well as possibilities of writing memos and different types of messages. You also have the possibility of categorizing the messages according to your own taste. Each message can exist in several categories. The different views allow you to list the messages according to ascending/descending date, grouped by topic or not, by categories, and by email address. There is no training for new employees in the use of Notes. There is an on-line tutorial, but you have to find it on your own. This results in many different ways of organizing the mailboxes. Some people delete almost everything right away, others categorize their email and store everything, or only the interesting messages. Several of the members of my project team stored almost everything and did not categorize. They also used the default view, which is "newest messages first, sorted on the date with no grouping on topics".

A Notes message can include text, formatted text in the form of underlined, bold, large, small, or coloured text, pictures, document links to specific documents in databases shared by both sender and receiver, and attachments. Attachments can be any file, like a Word document, a Freelance presentation, or a spreadsheet, and will be sent with the email message.

#### **ESOP/ELARK**

ESOP is an acronym for Electronic Case Follow-up, and is basically an application for storing all the information of interest concerning a particular project and its specific tasks. ESOP is organized around the concepts of categories, folders, tasks, sub-tasks, and documents. A folder is defined to be one specific topic or theme within a project, i.e. analysis phase, customer relations, and so on. These folders are then categorized according to the category they belong to. This can

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<sup>9</sup>A discussion database in Notes is pretty much the same as news on the Internet. You have a collection of topics within a discussion database with a certain theme. A new topic can be created by any of the participants. Each topic is a collection of responses to the initial message, and responses to the responses.

be the project name, the type of theme, or anything else you decide to be an appropriate category.

A folder, which is the topic or theme, can hold documents and tasks. Each task can store documents and sub-tasks. And sub-task can only store documents. All documents can have multiple levels, that is, responses to a document.

A document can be created in several ways: as a mail sent and stored in ESOP, as a Notes document like an agenda, minutes of meeting, a comment, and so on, as a copy fetched from your email database or ELARK, and a few other types. ELARK is an acronym for Electronic Archive, and is supposed to store folders with ended themes.

Each folder or theme, task and sub-task has a responsible person, a status, and a time span. The responsibility of the tasks and sub-tasks can be delegated to others by the responsible person. Different views order folders by status, responsible person, title, and categories. The tasks can be viewed according to status and responsible person.

There is an online guide to ESOP too, but mostly it is up to each project manager or project team whether ESOP should be used and in that case how. The user interface is not very intuitive, and a lot of different practices are possible. Some write almost all their email in ESOP, storing personal comments and other things not very crucial to the project. Others use their mailbox exclusively and store all their email there. ESOP is seen as a suggestion for how a project may organize its work.<sup>10</sup>

### **Phone and voicemail**

The phone is obviously an often used communication medium. As the function of the phone is well-known, I will not describe it here. But Statoil also has voicemail, or what you normally would call a personal answering machine. The use of voicemail is dependent on the owner checking for new messages daily. Enough people in Statoil ignored the voicemail, so that internally you could never trust that a message got through, unless you knew the receiver used it. This caused people to use Notes mail, as everybody used it. From the messages I collected, I have the following citation as an opening of an email message: *"I use the safe way."*

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<sup>10</sup>At the time of writing this, Statoil is about to deploy a new more integrated version of ESOP/ELARK called Sarepta. It is more comprehensive and the philosophy behind is more thoroughly considered. It will not be offered as a standard application like ESOP, but as an application to be bought by those who want it.



### **Fax**

The fax machine is not used much internally in Statoil. Typically, faxes were something sent to or received from external contacts, or if you had something not electronically stored to share with others.

### **Meetings**

Of course, meetings were used a lot. There were no rules in Statoil on how meetings should be organized when the participants were located at different places. Both formal meetings with agendas, as well as informal meetings were used extensively. Often people met at different events or when travelling, or someone just dropped by when they had a meeting at that location. Many even calculated some additional time just to see if someone was there. Informal meetings in the form of "we should have a talk", were also often used. All travelling was supposed to be signed by the manager of the department. This worked well as long as the manager worked in the same project, or had the budget responsibility for the project funds of that employee, but for dispersed teams which often are characterized by one or two persons from each department, the manager had no control over whether a certain travel was needed or not.

As in many other organizations, there were a lot of meetings in Statoil. Most of the projects in Statoil are accomplished by collocating the members, and meetings are often seen as one of the most important ways of collaborating and a basis for teamwork. The phrase "Let's have a meeting, so we can discuss this" was often heard. Often this meant that other people also should be brought into the discussion.

Social events were also something that was used. A dinner could be used as team building, as a reward, or most often as a way of getting to know external partners and create a relaxed setting for discussion. When out travelling and staying for the night, a shared dinner was common.

### **Video-conferencing**

Statoil has a video-conference room in all the large offices in Norway. This room has special equipment for high-standard video and audio, and also for document sharing. Intel ProShare video-conferencing was at that time not a supported product by the IT group. ProShare is a Windows based solution with the possibilities of a video window and sound. It is also possible to share applications like Notes in order to work jointly on a document. The solution is based on ISDN phone lines or a network. The team I followed ordered ProShare on their own initiative. The conference rooms had to be booked in advance, and someone would show up

to help set up the conference. But the video-conferencing possibility was not so popular that it was difficult to find a suitable time.

## 5.4 Rules and support for project work in Statoil

So far in this chapter I have introduced the Statoil organization, the internal market, and described the general use of different forms of contact. And in chapter 5.2 I described some of a project's external conditions. Here I will describe in more detail some of the specific rules and help a project can get from the Statoil organization.

In Statoil there is no *one way* to organize a project. The Demands & Procedures (KP) documentation specifies project management, but this is with the large, multi-milliard development projects in mind (plant or platform projects). Statoil Data also had its own rules on project management. This project management model was called MIDAS<sup>11</sup>. Each result unit or department can have their own rules for project management. There are units within human resources (P&O) which are working with management training and development, but as far as I have been able to find out (and I have tried hard), there are no absolute demands to a project working inter-departmentally. But there are courses that may be taken. At least one has a pretty through coverage of group dynamics (a course for learning about change processes and change management).

When it comes to support, there are more. I have mentioned all the different tools available, and how ESOP describes a suggested way of working. In addition, P&O has a training course for facilitators. A facilitator is trained in team practice and group dynamics, and can be used as a help in projects. The use of such a facilitator is completely voluntarily. A project manager can also make use of management training programs, handbooks, and so on.

The conclusion is that if a project team wants to, it may adopt any way of organizing and working. This holds particularly for "moonshine projects", but also for inter-departmental project and projects within departments without rules for project management. The internal market is functioning here too. If the team or the project manager find that they need something or someone to help them or support them in their work, they search for it in the internal market, or just hire an external consultant. This holds both for production of the product or for administration and organization of the project.

January 1998, a three year project called the information sharing project was started. This will obviously affect project management, as they are looking into

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<sup>11</sup>Statoil Data, now called IT, is about to change the project model they are using, and is now working with a model described in "A Guide to the Project Management Body of Knowledge" found at <http://www.pmi.org/>

the problems and challenges of sharing information, and at the same time ensuring quality and preventing information overload. Until then, there are no suggestions or rules, not even in a general form, for contact and communication in projects or otherwise. The closest I have come is a set of rules for using email I found on the Statoil's external web-server.<sup>12</sup> These rules are meant for people wanting to contact Statoil employees by email. The last five rules are non-technical advises for email use.

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<sup>12</sup><http://www.statoil.com/english/infotek/kommunba.html>

# Chapter 6

## The Case

*In this chapter I present the empirical data. The goal is to present as much as possible about what was going on, and how things went. This way I hope it is possible for you as a reader to feel that you have been a participant just as I was. Together with this description I will present some interesting tables and figures from the interviews. During this chapter I will not refer to theory or literature in any way.*

*I will first present the project and the members, and the main events during the observation period. Then I concentrate on the organization of the project, this is how they planned, worked, and controlled the project. I describe how the "official" picture of the project was, and while trying to forget what they said they did, I present a story from "behind the scene." This story is compiled from comments and opinions from both the core team members and others involved, the interviews, and my observations.*

*The communication situation is next. Within the project organization I describe how the core team members felt about the situation and some general descriptions on how they communicated. The following section concentrates on the interviews and presents their reasoning behind choosing communication tools. While I in the last section use the observations and the three threads I analysed to describe their concrete communication.*

### 6.1 The project and the members

#### 6.1.1 The members

The project I studied was a multi-million dollar project in its first stage: the development of a pilot version of their product. The product was a web application. As I want it to be difficult to determine the projects real name, I cannot tell any de-

tails about this web application, as this will make it easier to recognise the project. (There were about thirty web projects at that time in Statoil, so this information alone is not sufficient to determine the project's identity) When referring to the project, I will from now on use the false name 'Caesar'.

Caesar consisted of seven persons from six different departments, mostly service units, but also from operational units. People from other units were also involved and hired, as well as external consultants. As many as 30-40 people, depending on how you count, were probably some way involved in the project. Their physical locations were four different cities in Norway. The distance between the cities were so large that all travel between them was by air.

The individuals were dispersed, and so was their backgrounds, professions, and hierarchical positions. Though the differences in positions were not large enough to create unequal members of the Caesar project when it comes to power.

As the team members were employed in different units and had their "line manager"<sup>1</sup> in these units, they had different foci and different opinions on how problems should be solved. Hence, they all had two or more group memberships and roles. The core team members thus faced the problem of working as a representative of their unit and as a project member.

### 6.1.2 The project and an outline of the observation period

Caesar had a manager and the others were responsible for one or several areas. Except from web development their main tasks were the following: project management, both for the Caesar project and the sub-projects, budgets, funding, analysis of user situations and demands for software, marketing, and concept creation. Concept creation or "finding out what Caesar shall be" was probably the area they spent the most time on.

The core team of Caesar had met several times before I started the observation, so the members knew each other and had spent a lot of time on goal setting, funding and organizing the project. They had had gatherings with brainstorming, external speakers, and so on. The project had been "official" about four months when I was introduced to the project. They had individually developed some ideas within the areas they had agreed on, and had therefore several pieces of a first prototype. All this means that the core team already knew each other pretty well before I started my observations.

I joined Caesar when they were to start working and do the first joint effort to create one common prototype. They arranged a one week long "kickoff-meeting" where the core team members and all the people who were hired to do some work

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<sup>1</sup>"Line manager" is an expression in Statoil to show that we are talking about a manager in direct organisational line upwards using the official hierarchy.

met on one location with access to computers, offices, meeting rooms, presentation tools, and so on. This week was called "RPP I", which is an acronym for Rapid Prototyping Process. The idea behind was to "*smash together some smart brains, give them computers and collaboration opportunities, and see what happens.*" A timeline of the observation period can be found in figure 6.1.

The RPP II was meant to be arranged seven weeks before the final deadline, while it ended up three weeks before. In the twelve weeks between the two RPP weeks, the core team met about every fortnight for a half day or a day's meeting, and sometimes a dinner in the evening. Often these meetings were planned to coincide with external presentations, travelling to external partners or other meetings. Except from this, the individual members of the core team met and contacted each other when they felt the need for it.

The final deadline was the 1st of the month, while they finished the prototype by the 18th that month. The whole period was eighteen weeks. I planned the end of my observation period to be at the deadline. In a conflict between one of the core team members, the Caesar manager, and an external department, I was forced to witness as a "neutral observer." As this was just in front of one of the core team members and the external department, this situation did not cause my status in the core team to be changed dramatically, but as it was only three days left of the planned observation, I stopped the observation at that point. This was three weeks before they finalized the prototype. My observation period was then fifteen weeks long.

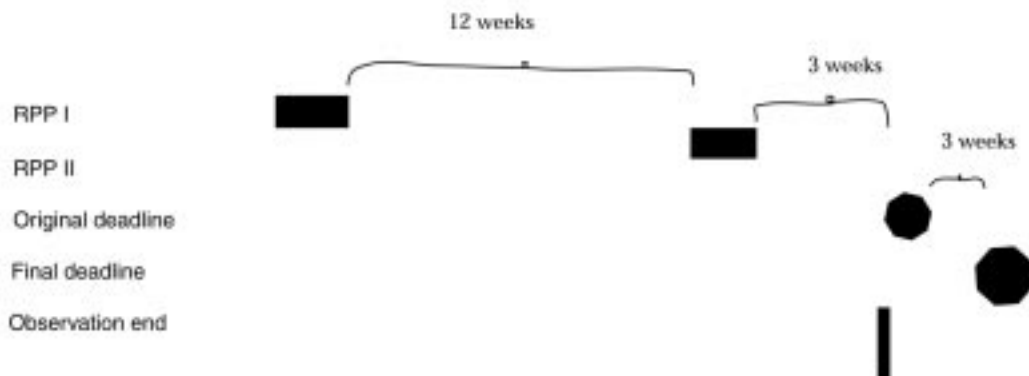


Figure 6.1: Overview of the observation period

## 6.2 How did they organize the work?

### 6.2.1 From the outside

In this section I will present the "official" picture of Caesar's organization, and then what I observed. It is particularly interesting to see how this "moonshine" project related to the rest of the Statoil organization.

The Caesar project was called a 'user-controlled' or a 'customer-controlled' project. The idea behind was that the project's developers worked closely together with the users continuously updating the pilot as a response to user comments. This means that from RPP I until the pilot release, the product was available to all the involved, and development was done from day to day. The users were also represented in the core team. The project's core was based on a few philosophies and concepts based on a set of experienced problems with the existing information infrastructure. These philosophies and concepts were connected as separate entities into what became known as 'the Caesar concept.' This concept was the basis for the marketing and the profile of the project.

I cite from the RPP I introduction mail received with the items of business:

*"Central resource personnel from [...] meet and create a common understanding together with the users of the product Caesar. The week will be carried out as a combination of a seminar, work-week, and workshop. The starting point is the works done in connection with the prototypes for Caesar.*

*Product:*

*A runnable prototype on Statoil's intranet satisfying the demanding Caesar users. The product is demonstrated for the customers during the RPP-week. The users and the developers are going through the specification for the final product. Needle-eyes are identified. Goals are worked out for next RPP week."*

They took pride in the organization of the project and used the 'user-controlled project' term a lot. They also often underlined what they saw as important: That the success of the project depended on 'demanding users.' One person in the core team had the responsibility of maintaining a Gantt diagram in order to keep track of the activities and the planning. This diagram was revised often and normally too late to be of any use. They were open about this, and attributed it to the fact that *"the project is moving with such a speed that Gantt diagrams can't follow us."*

The only external control of the project was the manager's boss, who was not very visible during the months I was doing the observations. They said that the

project was controlled by the fact that *"we are moving as fast as we can", "the road is created while we walk", and "because of the speed of the technological development, it cannot be planned ahead"*. More formally, the project was controlled by the following: it was funded by the customers and followed the project closely, the project had a few major milestones to follow, and if the customers were not satisfied they would stop the payments. Caesar also had a so-called 'reference group'. It consisted of several resource persons with an interest in Caesar. The intentions of this group were unclear, but some saw it as a forum for conflict resolution, while others saw it just as a group of resource persons. I never saw that this group had any influence on the project.<sup>2</sup>

Another related thing they were open about was the fact that they had no specifications of the product, and that the project was started only on the basis of a one page description of the ideas. They often claimed that the only way to make such a product possible, was to put together bright people with different areas of expertise and let them *"sharpen themselves on each other."* This close teamwork, or cross-disciplinary work was required to do the really clever things. Or as one core team member expressed it: *"Project plans are replaced by best judgment. Then the tracker dogs, those with the best noses, must be put together in a team, together with doers."*

This way of controlling and organizing a project was often compared to the traditional 'waterfall-method' found within systems development. It certainly contrasted the MIDAS model used by Statoil Data which was based on the 'waterfall-method.' Although Statoil Data was involved in the project, it was not a project under the control of Statoil Data. Using MIDAS was therefore not a demand.

The core team was also a pretty new concept in Statoil. Few knew what a 'core team' was. Terms like 'core team thinking' and 'core team organizing' were used by the project members. The idea behind a core team was that they were chosen to be in the core team because of their excellency and professional competence related to the goals of the project. Being responsible for one area of the activities, they all discussed decisions, and were together responsible for the project as a whole and its pieces. The core team meetings were essential in this, and for refining the concept. Social events were considered important to create a unified and coherent team where the members knew each other well.

### 6.2.2 Behind the scene

This was the official picture of the Caesar project, but what happened behind the scene? What I present here are alternative interpretations I have been offered from several persons and on several occasions, compiled together with my observations.

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<sup>2</sup>I believe the reference group was more involved in the start-up of the project.



I do not claim this to be the correct view of the project, but rather a less "polished" version. The main point about this section is not to find the correct view of the Caesar project, but rather present the life of the project and what they had to struggle with.

### **User-control**

The "user-control" of the project might have been a bit exaggerated. There were several reasons to that. One user was in the core team, and was supposed to keep some of the control and to set the directions, but was soon a part of the project where the project's success was just as important to her as for the rest of the core team members. This user did not involve a very large part of her organization either. This way the Caesar participant no longer was a representative for her organization, but often became a Caesar representative instead.

The close work between the users and the developers was not as close as it was intended. The users were not the real users, but often the people responsible for the budgets for Caesar and who allocated the money in the first place. The focus then quickly became "satisfy the allocator" and not the user. The real users were often too busy doing their job, and the customer units were not clever enough to allocate specific time for Caesar project related work. The people responsible for the budgets had not enough time either, and the amount of collaboration diminished.

The Caesar project also had visions and with those visions, words and concepts which were difficult to understand. There was also an eagerness to use new technology and the very "hottest" in the development of the prototype. This was also hard to understand, and it was often unclear what the concrete results of the visions would become. This way the customers who should be working closely with the project members, be demanding, and control the project, ended up not understanding where the project was heading and had no control of the daily work.

The result was that they often just relaxed, watched from a distance, and when something was presented, they could criticize it and ask for changes. They could do this as the project and the customers never had agreed to exactly what should be delivered in the form of a specification. The result was sometimes double work, without an extra pay from the customer. And as the project had no plans, Gantt diagrams, or other control mechanism, it was difficult to know what was happening. The result of all this was that the customers did not have much control over the project. They could of course stop their funding, which also happened. But as Caesar had several customers and always could sell the concept to others, this was not really a threat as long as the customers did not talk to each other and all decided to stop the funding.

There was created one mechanism which could have been a way of "peaking" into the project's life. An ESOP database was created for the project where all progress reports, email, documents and other things were supposed to be stored. ESOP was not much used (I will get back to this), and this possibility disappeared. The RPP weeks was another way for the customers to get an update on the status, and to give feedback and discuss the future directions. The last day of the weeks was used for this user presentation and discussion.

There were different opinions on the effect of using RPP weeks instead of smaller groups meeting more often or other ways of organizing. It was one of the core team members who insisted on using RPP and who saw it as an experiment. Others felt that the purposes of the RPP were unclear and that other ways of organizing would have been better. The first RPP week was quite different from number two. The first week was marked by an uncertainty to what to do and a lot of discussions where several topics were discussed at once. It was used to refine the concepts and to try to convert the ideas into something concrete that could be seen. Most of what was created during this week was replaced one or more times during the months before the release.

The second RPP week was more of a status meeting: what is left to do? What can stop our progress? The goal was to cover all aspects, problems, and threads, and to try to wrap things together. Identifying "stoppers" was essential. Two lists of things that had to be delivered or finished before the RPP II were distributed. Both RPP weeks included a lot of people, between 20 and 30 participated one or more days. One of the core team members put it this way:

*"RPP was just something A introduced just like that, which he wanted to test. He had heard about that way of working. And in the moment he had said it, he presumed that everybody understood, and then we just did it. But the problem was that there was never anybody who explained how this really got together, that is, what it consisted of, how the process for this kind of weeks was. And the one in [location] was torpedoed by B, he wanted to do it his way. A had made his agenda, but B suddenly wanted to do it his way. RPP II, then we just didn't give a damn and did what we wanted to."*

### **Who is in control?**

But, if the customers were not in control, then who was? The core team was obviously the place where the main decisions were taken and in that way they were self-controlled. But as I wrote in the last chapter, they took pride in not using tools for controlling the project, and the milestones they were talking about were really only one, as all the others were moved as they felt for it. The manager's

boss was pretty invisible, but at a couple of occasions he entered the scene and showed that he had some kind of influence. If he wanted to use that influence, is a different matter. As Caesar was managed by his subordinate, it was also his department's project, and on the occasions where Caesar was criticized, he was automatically a representative for Caesar. But, were there others with influence?

Yes, each of the Caesar core team members had a supervisor, and they were "hoovering" in the background. They had of course the responsibility of keeping track of what happened, but they also had a direct influence on their subordinates. The possibility of putting pressure on the superior of others in the core team was there, and was done on a number of occasions. The supervisor could also put a direct pressure on the Caesar project, or using the manager's boss who were in the formal position. There were also other examples of how supervisors or others could "make trouble" by using their contact network and saying negative things.

### **Politicking**

Now we are onto the political side of the organization. The organization described in the last chapter opens up for a lot of politics. Conflicting projects, conflicting interests, and different viewpoints always occur, and there are different ways of handling such things. Within each department or location, there are rules and a culture for how it should be handled, but conflicts across the organization were often "walking upwards." Each person talked to her supervisor, which often protected and agreed with the subordinate, and the conflict had moved one step up the ladder. This can gain speed, and I was told that several projects or initiatives have been stopped because of such conflicts building and then ending in a war which someone even further up stopped.

When we have this perspective, it is interesting to note that in large projects the project manager has the personnel responsibility for the project members working full-time in the project. This can be seen as if a new temporary unit is created. This way the project members become a part of this project organization and are more involved. In smaller projects and especially in a 'moonshine' project, the members often do not work full-time in the project and anyway keep the main organizational belonging to their department. In these cases, the department supervisor keeps the personnel responsibility, which also includes setting goals for the development of the person's skills and work situation, and something called MAS, or 'co-worker conversation.' In a MAS everyone gets a feedback from their supervisor on how they have succeeded in reaching their goals set in the last MAS, and on several standard measures. (This is called 'management by objectives' in the USA.) The supervisor may ask the project manager for information about the subordinate's work, but there is no formal feedback from the project manager. This way of belonging to a certain department or project can be another

factor contributing to the possibility of politicking.

### **One project?**

The Caesar project was seen and spoken about as one project, but several people, including people from the core team, felt that it was rather several projects which were coordinated through an umbrella project. Each of the members had their very specific area of responsibility, and they received a certain amount of funding for their activities from the Caesar project after "negotiation" with the project manager. On several occasions additional funding was given on request, or moved from one core team member to another. The activities of the members were of varying degree connected with the others' activities. This way only the project manager and the person responsible for the practical implementation of the shell product really needed to be in contact with all the core team members.

**The core team** Several members also felt that the core team meetings often were characterized by hidden agendas. The allocation of money and the status of each part of the project were recurrent topics. This is contrasted to what one of the other core team members said: *"[...] people have been open. Even though we have sometimes been slovenly, and had fights about trivial things, and some persons have drawn and shot before thinking. I interpret this as an eagerness to succeed and not as evilness."* The team-building by using dinners was perceived differently by the different core team members. Some felt it was too many dinners and a too high standard, others meant the dinners were very important in keeping the team together, and in creating an informal atmosphere where creativity could prosper.

Often were decisions concerning one person's responsibility area taken outside the core team meetings, and the rest of the team was informed on the next meeting. Despite this, the core team meetings were important to the directions of the project, had the main control and was regulating the different sub-projects. It was often used as a place for conflict resolution, mainly conflict of viewpoint, as conflicts of interest rarely surfaced. The "to be sharpened on the others" was often present, though often only between a few of the members, and the same members each time. These were also the most satisfied with what they had got and learned from the project.

Did the core team contribute to the creation of one, single project? Yes it did, the core team meetings seemed essential to keeping the project "on track", to discuss complicated things, and to take the important decisions concerning the whole project. There was not a "correct" way of running a core team meeting, although it had an agenda, it was often only a list of the different areas. There was also no common understanding of what the core team was supposed to do; what was

it authorised to do? This way the meeting became what the participants wanted it to be, and with hidden agendas some of the meetings could be characterized as a "circus." And often other people were included in the core team meetings, to report or discuss something. This made the core team meetings even larger, and several core team members felt the core team was too large. As one said it: *"[It was] a bit too much Polish parliament style over the meetings."*

But it is clear that without the core team there would not have been one project, but several cooperating projects.

**Coherent concept and ideas?** Another way one may ask if Caesar was one project, is whether the main concept was what it seemed to be. The main ideas behind was stable, but the different parts of the concept did not seem to fit too well to each other and to the ideas. Several conflicting metaphors were used, and there was some confusion about what Caesar really was. The different parts also took different shapes for different customers, and although the intentions behind were the same, it sometimes seemed like the solutions were basically different, and that Caesar was not one product, but several. This can be compared to building and delivering component based sound systems. You can pick different brands and variants of speakers, CD players, and so on. But if a sound system comes without the amplifier, or if just one speaker is delivered, would you call it a stereo sound system? Probably not, and some people meant that this was exactly what the Caesar project did. Their Caesar products were so different that it was difficult to see what the common and main components of Caesar were. Even some core team members expressed being resented about delivering what they felt was a crippled product.

Because of this, Caesar was accused of adapting the solutions and changing the goals too quickly. It was said that it had no firm shape, Caesar was just a lump of clay, and whatever the customers said they wanted solved, the Caesar product could be molded to fit. If this is correct, the question is whether this was a problem as long as the customers were satisfied? The problem seemed to be that several other projects felt that Caesar stepped into their areas and started to compete. Caesar was possibly felt as a threat.

### **A right to live?**

The project was not controlled as other projects, the customers did not know what they would get, and there were no specifications. Why was Caesar allowed to continue? One answer can be that the reputation of the people involved was the guarantee needed. Most of the core team members had a long history in the Statoil organization. Another answer or a complimentary answer can be that the customers sensed the creativity and understood the possibilities of this project.

It is not difficult to conclude that a traditional project with specifications, Gantt diagrams, and plans would have ended up with quite a different product in the end. Without all the formal plans, they were able to react quickly to the opportunities and challenges they met. But could the creativity and the short response time to changed conditions and terms exist in a project with more formal control mechanisms? It is difficult to say, but my personal opinion is that it could have been possible to classify the activities into two, according to whether they were suitable for planning or not. This way the organizational form of "*moving as fast as we can*", as one put it, could have been surveyed in a better way, and problem situations could have been acted earlier. Both the project members and the environment were split in their opinions on this point. It was easy to see, as the advertising of the Caesar project organization as different raised some fuzz and talk.

### **Collocation?**

Another thing related to this, is whether the Caesar project could have accomplished what it did using the traditional collocation of the people participating? In such a scenario, some of the people involved would probably have been other people, as collocation either means that all already have to be located at one location, or that some must move. This puts restrictions on who you can involve in a project. The other thing is that the members of the project would lose their existing environments, support, and conditions, and would have to start creating a common world with the other project members. The members would then have had a more equal context to work in. This could obviously have made it simpler to cooperate, sharing common perspectives, and so on, but if we see conflicts of viewpoint as something that can be used positively and end in a more advanced, common understanding, this collocation would result in less "exciting" ideas. Losing the existing surroundings and external impressions can reduce the ability to create interesting solutions. In a project as Caesar where the different areas were pretty different and needed different support and organization, it may have been an asset to be dispersed, even though they had to pay with conflicts and a less coherent team.

### **The construction of a project organization**

'Core team thinking', 'Rapid Prototyping Process', 'User-controlled project', "Caesar is unique in Statoil". These were all expressions used by the core team members both among themselves and in conversations with others. These terms were used as "knobs" for defining the way the Caesar project was organized. They were proud of the creativity and often accented the difference between what one called

*”platform-building projects”* (used both in a concrete and transferred meaning) and the Caesar project in terms of organization, product, and results.

Having covered different ways of understanding the organization of the Caesar project, I will in the next section move on to the communication situation in the core team and what the core team members said about it.

### 6.3 Opinions on the communication situation

In the last section I focused on the project organization, how the project was officially presented and talked about, and what the core team members and others said and felt about the project. This organization, relationships, culture, norms, external relationships, procedures, and so on have a direct influence on how the communication flows.

There were a differed degree of satisfaction with being part of Caesar. The tone was informal, they had a lot of social gatherings, and on several occasions different people uttered that it was interesting to work together with people with such different backgrounds. The persons most involved in the project (measured in time) were also the most satisfied. Which way the casual link goes here, I will not speculate in. But when talking about satisfaction, it was always stressed that the personal relationships gained were the most rewarding. It was said that *”the production processes do not count much, but rather the human processes and relations.”* The persons claiming to have a good relationship also met, not surprisingly, more often than the others in addition to the core team meetings. These persons also exchanged the most email, and phoned each other more often. And back to where we started: they were also the most central in the project.

It was also a general agreement that the cross-disciplinary work form created new forms of thinking and that the members individually had *”grown”* during the project. One person told me there was less contact in Caesar than in other projects, but added that if the project was seen as several projects cooperating, it had not be less, but rather more contact. So, whether the amount of contact was good enough, or too little, or too much, they did not agree upon, but they all agreed that the project had not been possible to accomplish without personal, face to face contact.

The need for seeing the non-verbal language was stressed. But still, several of the members felt that large parts of the core team meetings were a waste of time. They claimed that direct communication between two or three people would have been better and more efficient. They did not feel that any technological remedy would have made any change to this situation. What they needed was the full-bodied communication form found in face to face contact, and although they had the possibility of using high quality video-conferencing equipment, it

was never used. They did try Intel Proshare using ISDN, but as the product was just introduced in the Statoil system, they had a lot of technical problems, and when it first worked, it was not experienced as very useful. As one put it: *"It gave me nothing extra."* But he was open for the possibility that the integration of telephone, video, and computers can be useful in the future.

As we will see in the next sections, their use of email, telephone, and informal meetings differed, but they all used occasions with face to face contact as the main arena for discussions and solving conflicts. Often they met in connection with another meeting, a presentation or other gatherings, and they often used the opportunity to spend maybe as much as two or three hours *"to have a chat."*

They were all dissatisfied with ESOP, the project database in Lotus Notes, and as only the administrative staff stored things there and just one person in addition used it the way it was meant, nobody even commented on it when the use stopped completely. They felt the user interface was clumsy, and it was difficult to use. Some also felt that the concept of including all the email messages and documents in ESOP was awkward. Most of them had also no previous experience using it, and they got no training. No other Notes databases were used either, and this way the main electronic communication was through the Notes mail system, and it was used extensively.

The main forms of communication they had were formal and informal face to face meetings, telephone, and email. For some of the core team members, voicemail could and was used, while others did not listen to the voicemail. Of the other possibilities they had, some were tested and not much used: ESOP, video-conferencing, and application sharing. Others were not used at all: discussion databases, other Notes databases, fax, high quality video-conferencing, and telephone conferencing.

## **6.4 Their understanding of choosing tools for communication**

In the communication situation described in the last section, the core team members all the time faced the choice of how to contact the other members. Through interviews I tried to find out what they thought about this situation, and how they reasoned about making these choices. The interviews were divided into six main areas:

1. project organization,
2. practical cooperation,
3. feelings about the organization of the project and the cooperation,



4. wishes for similar future work,
5. a task where they were asked to outline the organization and plan the communication of a one year project with four members situated in different cities, and
6. a table with several types of media or tools where they were asked to indicate to what the medium/tool was suited for, and to what it was not suited for.

Data from items one and three have been used earlier in this chapter. The remaining four will be reported on here. I will first present what the three respondents said in the first four items. This will be presented according to categories which I have extracted from the interviews. The last two items will be presented separately.

They all three had more than three years of experience with Lotus Notes, and additional experience with computers and email. One had also several years of application programming experience in Notes. The two others categorized themselves as experienced users, but not as advanced users. Working in a project creating a web application, they can be considered having more than an average understanding of the possibilities and limitations. I will here use the names John, Eric, and Peter to refer to the respondents.

### 6.4.1 Reasoning about communication

#### Email

They all agreed that email was well suited for short and simple messages. Messages of the types: "Will you be there next Monday?", "Shall we agree on the first option?", "I will be away the next week.", "Please send me a copy of your latest presentation.", and so on. They also agreed that email was very suitable for sending documents and attachments. (Although John noted that ESOP should have been used for at least some of these) Peter said it this way:

*"If it is a simple question if I will be available or if you have this or that, or if you can get that equipment. Then it is no problem, then you answer back using email. Yes or no or maybe."*

Eric meant that email was suited for "logically and structured" messages as opposite to concerning "human relations." He referred to messages with bullet items, or where arguments were lined up. He also said: "and I feel mail has something to do with presence, that is, sharing knowledge with others. I have got

*[something] and want to share it with some friends.”* He felt that email can be used in order to keep in touch with people, without spending so much time. This way email can be a replacement for the telephone. Eric also meant that email was very well suited for manipulation and for a skirmish either as a diversion or as a reconnaissance before a meeting. This manipulation can be of several types, and he provided the following:

- copying others, especially managers,
- blind copying managers and allies,
- forwarding in order to orient others about what was happening,
- forwarding and commenting messages,
- ignoring messages,
- pretending not having read messages,
- to “excite” the system and then see what happens (by sending an unexpected or provocative message),
- to provoke, and then let the subject die,
- to check out a person’s understanding of something, a topic or a problem situation (by presenting some blunt statements),
- to present certain topics as vital, while others were more important (to confuse),
- to “*keep the cards close to the body*”, hiding the real intentions (related to the one above) This can be done by avoiding the topic in the message. It is more difficult to ask again for the same thing when communicating through email.

Quite opposite, Peter argued this way about receiving blunt, unfriendly, or quarrelsome messages:

*” I just don’t answer. On the whole mail. And then I have a chat with that person on a later occasion [face to face], or if it should be raised in a larger context. We have in some conflicts been forced to involve our supervisors to solve such conflicts.”*

When he got difficult messages, his response was to *"let them wait."* If it is a blunt mail, he often chose to ignore it as explained above. Sometimes he answered, but only if he thought that the answer would end the message exchange, because *"answers will lead to more answers."* If there was a misunderstanding, he would make a phone call in order to correct it. If messages were really difficult and possibly could lead to a conflict and/or showed a discrepancy with his goals, he preferred to bring the issue up next time they met face to face or to look up the person. Peter also felt that the distance between people and the use of email can keep a conflict to a minimum compared to the same conflict if the persons involved were located in the same building. They would not meet accidentally and rip the conflict open again.

John said his communication form was either email or face to face. He preferred the rich communication, because when email was not appropriate, normally the richness was needed: *"You are able to communicate in a more proper way."* The telephone was for short messages, and for clarifications he needed fast. He meant that email was very well suited for long clarifications and explanations. This way people listened to the whole message, he could document the statements, and he would be more sure that what he wanted to be done was done, and not only parts of it. He said:

*"I have experienced far too often that if I make a call, something in that direction will happen, but not exactly what I want. You can extend the written communication with documentation and cuts and stuff like that. So, my communication form is email."*

### **Human relations**

Human relations were very important to all of them. They all spent a considerable part of the interview time talking about human relations. They said that human relations were essential to projects like Caesar, and that these relations could not have been established without face to face communication. Both John and Eric used the words 'body language', and stressed the importance of being able to access the richness of the communication in a face to face situation. Peter expressed it like this:

*"I don't think it is possible to organize a project like this on a long distance. One have to feel and touch each other. Get the shades of the answers, and the transmissions of information you wish to do."*

They all stressed the importance of knowing each other, trusting each other, and sharing something more than just the work. *"Mental ties"*, *"reciprocal*

*trust*", *"having fun*", *"sharpen oneself on others*", these are all expressions signifying the importance of the human relationships.

John said that when he had meetings at other locations, he often just popped by people, to see them, have a chat, or what he called to *"just talk rubbish with them."* Often he could meet 3-6 people this way with only one scheduled meeting. It was an important part of *"making things go around."* It was important to *"see people straight into their eyes."* This way you could interpret their body language and assess whether they were going to do what you wanted or not. He said you often have to go and see people in order to have them do something for you, or else they will often just ignore you. This "popping by" was a compliment to people, *"you had actually travelled to go and see them. People get an acknowledgment by that."* Although John preferred face to face communication, he also said that in these matters telephone was better than email. He also mentioned the lunch as a very important time for relationship building, exchanging information, and make things work smoothly.

Eric had almost the same view, and argued that all the senses were important, and that non-productive informal meetings were very important in making things run. But at the same time he said telephone was perfectly okay for human relations. But his example showed that it was more a "keeping the relation alive": *"Such as: I haven't heard from you in a while, how are things going?"* John made clear that he always preferred the face to face contact, if possible.

Eric also meant that a part of a human relation is some *"rules of the game."* These rules develop between the two, and also includes how you shall communicate. He states:

*"You have to separate between when email is suitable, and when you should communicate orally. I think that if you saw through my Lotus Notes database [email database], I haven't communicated one single time with [X]. If I send a mail; we can try right now, if he's here; it wouldn't take long before he came running, asking what is wrong. Then some of the rules of the game between the two of us have been broken."*

When it comes to social events, such as dinners in the evening, they disagreed. Peter saw this as primarily a team-building activity, while John and Eric felt it was to be used as a reward. John meant that this was the only side of such social events. Human relationships were created and maintained in the lunch, during work, and during time off socializing without organizing something special. He claimed that the dinners had made no difference in the project. Eric on the other hand, saw dinners as a nice way to establish relationships with people you did not know in beforehand. This was often the occasion when having dinners with external partners, which is quite different from project dinners.

### Collaboration

There was no doubt what they felt was the appropriate way of collaborating, that is, working concrete together on something. They all meant that the only way to work dispersed in a team was to divide the labour into separate responsibility areas. This way it was possible to work without having to collaborate. On certain things they had to collaborate. Workshops, sitting together, and shorter or longer periods of collocation were all suggested as alternative ways of working. John said application sharing could be a way of doing a demonstration, training, or helping someone, but no one mentioned the possibility of working jointly on something using application sharing. They attributed the lack of video-conferencing use and application sharing to the technical problems and an immature technology. But they were open to different ways of using these tools or others in the future.

### ESOP

I have written earlier that ESOP was not used and why. During the interviews, some interesting things were said. They all said that ESOP was "*in the best case half-good*" or "*not easy to use.*" John said he earlier had used specific databases tailored to different types of communication, like external communication, administration, progress reports, documentation, and so on. He had never used ESOP before. But he meant that Caesar should have used ESOP more, not because of the excellency of ESOP, but rather that Caesar would have benefited from it. It was the structure and accessibility to important documents and documentation that would be the benefit. It was John who also said that they should have created a discussion database. (But "*it never became that way.*")

Another thing which came up in the interviews, was the fact that the Caesar ESOP database was found together with the ESOP databases of other projects belonging to the department of the project manager. This symbolised Caesar as being subordinate to that department. It was difficult to feel an ownership in this database, as one of the assets of Caesar was its cross-departmental nature.

### Decisions

The use of the telephone for simple and quick decisions was something they all felt they comfortable with. Peter said he would use email for the same types of decisions, and that he also would use a phone call to discuss in some length a problem, and then come to a conclusion. John on the other hand, only used the telephone for the simple decisions. "*Substantiated decisions*", as he put it, shall be taken face to face. Eric was a bit unclear about decision making. He said it was too many formal meetings, and that decisions could have been taken between

two or three directly involved in the question. How they communicated about this decision, seemed to be of no relevance.

But as for the simple decisions, they also agreed that the more complex decisions had to be taken in a meeting with minutes of meeting. Peter used the following three criteria to determine the type of decision: *"the number of facets, degree of complexity, and number of details."*

The opinions on video-conferencing for taking decisions were pretty unanimous: It can be used for follow-up meetings and formalities, but not as meetings meant for decisions. Eric also added that people became formal in front of video-conferencing equipment, yes, even when computers were just involved in meetings he found that people had a more formal attitude. He also felt that you do not get much of the body language in video-conferencing.

### **Conflicts and politicking**

As I referred to in the handling of email, Eric meant that with no rules from the company or the project, it was possible to use email for manipulation. He extended this to all types of communication and contact. He also mentioned informal versus formal meetings, meetings with and without an agenda, where should documents go, what must be documented, and so on. As I have referred to earlier, also John and Peter were quite clear on how they used different ways of communicating to accomplish what they wanted. John often dropped by, and normally *"saw people straight into their eyes"* when asking for something, while Peter would refrain from answering a message and instead take a phone, travel to meet the person, or wait until next time they met. Though it was only Eric who used the word 'manipulating'. Peter used the word 'politicking', but referred to external people and the marketing of the product.

Both John and Peter explicitly said that conflicts shall be handled in face to face settings, while Eric with his more "conflict-oriented perspective", chose to use the medium which strengthened his position. He was also quite open about that just as all the others in the core team had their hidden agendas, he also had his.

### **Summary**

I here present a table summarizing what they said (table 6.1).

### **6.4.2 Project planning task**

This first part of the interview was semi-structured, and after setting the topic with a few sentences for each of six parts of interview, I let the respondents talk

Topic	John	Eric	Peter
Email	Short & simple message Documents & attachments Substantiated messages Either email or face to face	Short & simple message Documents & attachments Logical, structured messages Presence Manipulation	Short & simple message Documents & attachments Difficult messages -> wait, then face to face, or phone
Relationships	Very important Trust Body language Pop by/talk rubbish Lunchtime Dinners ->reward	Very important Trust Body language Rules between individuals Dinners -> reward/relationship building	Very important Trust Shades of answers Dinners ->teambuilding
Telephone	Simple & quick decisions Not preferred	Simple & quick decisions Keep the relations alive	Simple & quick decisions Quick communication
Collaboration	Sit together Application sharing for demonstration & teaching	Sit together	Sit together
ESOP	Not any good Location of database Discussion database	Not any good Location of database	Not any good
Decisions	Quick/simple ->phone Complex ->formal meeting Follow-ups ->video conf. Substantiated ->face to face	Quick/simple ->phone Complex ->formal meeting Follow-ups ->video conf. Too many formal meetings	Quick/simple ->phone (or email) Complex ->formal meeting Follow-ups ->video conf.
Conflicts & politicking	Face to face Straight into eyes	No rules exist conflict ->strengthen position	Face to face

Table 6.1: Media preference summary.

freely, while I guided the direction by asking them to go deeper into something, or by asking questions about interesting things they touched. I did not say it was their thoughts about choosing communication media that was of interest to me. It probably became more and more visible, but I used this approach in order to come as close as possible to what is called an "unobtrusive interview." But my questions made them think, and you can never be sure if they came up with thoughts and reasons during the interview which they did not have earlier.

This last part of the interview, however, I asked them think about project planning and communication tool choices. While the first part of the interview hopefully measured things they had thought about earlier, both the project planning task and the tool classification task measured how they thought about this when

**asked** to think about it.

The project planning task was presented like this:

*"I would like to describe a fictitious project for you: You are the project manager of a project with four persons located in Oslo, Bergen, Trondheim, and Stavanger. The project is spanning one year, and your task is to create a report with recommendations for how Statoil shall use the intranet in future projects. This report shall be in an electronic form. Can you use a time axis from the 1st of January to the 31st of December to plan how you shall organize the project and how you shall organize the contact between the members?"*

The project planning task did not give much new information when it comes to media choice, but it was interesting and useful to see how their picture of a project organization related to their thoughts about choosing media.

### **Peter**

Peter divided the project into the following tasks: Organization of the team, team-building/culture creation, planning, production work, information collection, forming conclusions, make recommendation, presentations, politicking, and presentation of the final report.

Organizing the team consisted of getting the right people to join the project and of preliminary planning. This would take approximately one month. Production work and planning were two tasks which were done throughout the year. The first three months would be used for *"team-building and culture creation."* These first three months would also have face to face meetings every fortnight with two gatherings of two and one week long, respectively. The first six months of the project would include information collection characterized by travels and meetings with external information sources. All or some of the project members would also meet on these trips.

The forming of the conclusions should start about halfway through the project, and the production of the report should be divided into separable tasks with each member having responsibility for a certain part. In this work, ESOP could be used as a way of cooperating. Presentations should be held throughout the project, to inform about what the project was doing and to start preparing *"the selling"* of the report. The last four months should also include politicking, in order to gain support for the report's conclusions and work.

The second half of the project, the meetings would be rarer, maybe only one every four weeks. But telephone and email would be used in order to keep in touch and coordinate the activities. Especially email would be important for



coordination. Of course, in addition to the regular meetings, two or three of the members could meet in order to discuss specific topics of importance to their work.

Peter stressed the role of the project manager as a facilitator for the work of the project team. It was his responsibility to help and support the other members so that they were able to do the work best possibly.

### John

John stressed the importance of dividing tasks and working strictly in phases. The project should have exact milestones, and an expected deliverance. If they were not finished, the deliverance should be done anyway, but noting where things were lacking. This way the progress of the project could be ensured. As he put it: *"You have to decide what you are going to be good at, and be that. In the next phase you can be good at something different, but if you are not good at one thing in one phase, you cannot count on being able to do something good in the next phase which is based on the first."*

He divided the project into four phases: Organization period, analysis, judgment, and report writing. For each phase something should be delivered. In the organization period of three months the team would get to know each other, assign roles, decide how to cooperate, and chart the area: their mandate, the external conditions, the theme, and the basic concepts and dimensions of the theme.

The analysis phase should be a detailed charting asking the following questions: How is the situation today? Both what is used and how is it used? Next, what is needed? And finally, what will we accomplish? All these questions are seen from the organization's side and not the personal opinions of the project members.

The next phase, the judgment phase, would handle the different solutions available, a comparison between the wanted solution and the available solutions, and the determining of the criteria for choosing a solution, maybe creating a few possible scenarios.

The report writing should include the substantiation of the different conclusions, the discussion of alternatives, and the suggestion of a plan.

In the first phases, John suggested meetings about every fortnight and something he called *"core time."* Core time should be between two and five days and was characterized by intensive face to face collaboration. Each phase should have at least one such 'core time.' The last two phases did not need fixed meetings, but rather shorter or longer time of core time where only a few of the project members attended. This is about the same as Peter's suggestion.

Email, telephone, and the ESOP folder for each task should be used for communication in between meetings and core time. John commented on ESOP and

said it just gives you the end result and not the process, which can be quite as important. He also said again that the lunchtime was important, and that complete collocation would have been the best way to organize the project.

### **Eric**

Eric chose a completely different way of organizing the project. He was also the one most keen to say that Caesar was organized differently than other Statoil projects. When sketching the way of organizing, he focused on the different functions needed to be handled in a project. The organization can be seen in figure 6.2. The core team was the central of the information flow. This team should be inhabited by the project manager and one person from each of the other teams (except Statoil Basis). It should be a "*no feelings*" team, and have the responsibility for the project management, control, and funding. Statoil Basis was the mother organization with all the support, rules, Statoil Data, and so on. The communication (denoted by grey circles) to Statoil Basis could be Notes mail, electronic form, and databases. The contact with the users should be based on personal relations and face to face communication. The internal communication in the core team could be based on formal meetings and email.

The strategic team was the creative and the most important part of the project when it came to building a concept. They had the responsibility for the whats, hows, and whys in the project. This team did not need to have formal meetings, just workshops and meetings when necessary. The strategic team would be characterized by different fractions and politics. The production team, on the other hand, could be organized the traditional way with Gantt diagrams and tight project management. Finally, the external relations team had the responsibility for searching for relevant information from outside the project, both in Statoil and the rest of the world. These teams had separate functions, but one person could be a member of several teams.

The communication between the core team, the strategic team, the production team, and the external relations team could be based on Notes mail and telephone, and if necessary, meetings. Each of the teams could be collocated, but it was not a necessity.

Even though the others also had organized the project in a way that might have been a bit too complicated with only four members, Eric completely ignored the size of the team and saw the project organization in a Statoil perspective. And this is important: all the three different ways of organizing presented here are coloured by the Statoil organization and each person's view of Statoil. Three respondents suggested three different ways of organizing. While Peter focused on the building of the team and the politicking of getting support for the report, John focused on the production process, how the team should reach its conclusions. Finally, Eric

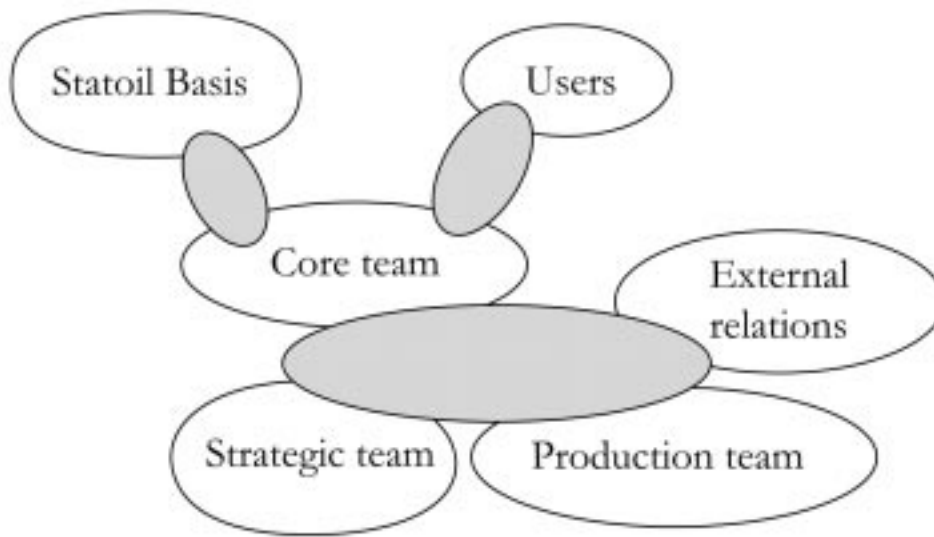


Figure 6.2: Eric's project organisation.

focused on the different functions a team need to handle, and organized the team according to these.

### 6.4.3 Tool classification task

In the tool classification task they were given a form with eight rows: telephone, formal meeting, informal meeting, email, ESOP, video-conferencing, social arrangement, and an empty row. For each of these there were a column with "suited for" and "not suited for" as headings. I presented the task like this:

*"As a finish I have made a small overview of different ways of communicating with others. Can we together go through this, and fill out how you experience what the different forms are suitable for, and what they are not suitable for?"*

This task was meant as way of ensuring that I got at least some information about what they thought about the different media. If they had been less conscious about their media choices, the interviews would have been less informing. It turned out that the forms did not disclose much new information. I have therefore chosen not to include the individual forms, but just a compiled version incorporating the individual forms which can be found in table 6.2. The last row holds the respondents' suggestions.

	Suited for:	Not suited for:
Phone	Short questions Simple decisions Socializing (better than email)	Decisions
Formal meeting	Formal decisions Action items	Personal conversations "Politicking"
Informal meeting	Workshop Partial decisions Human relationships	Decisions
Email	Documentation Substantiated arguments	Human relations Documents
ESOP	Documents ?	Simple communication ?
Video-conferencing	Formalities Additional meetings Nothing	Decisions Manipulation Body language
Social event	Reward Socializing Teambuilding	Work progress Personal matters
Group systems	Brainstorming	Decisions
Application sharing	Demonstrations	-
Discussion database	Tests	-
	Ideas	-
	-	-

Table 6.2: Overview of media.

## 6.5 Observed communication

In the last section I reported on the interviews and how they reasoned about choosing communication media. In this section I will report on my observations of the concrete communication between the core team members. The section is divided in two: one general part and one part handling three different threads of communication which occurred during the observation period.

### 6.5.1 General observations

#### The atmosphere and characteristics of the communication

The Caesar project had a lot of strong people in the core team. They were not silent people, and they knew where they wanted to go. The project manager told me he had been looking for strong people, because Caesar needed such people in order to survive in an organization like Statoil: a lot of different opinions, conflicts, and politics. The project was characterised by conflicts, at times pretty "violent" meetings, and the use of strong words and feelings.

Each of the persons were involved in the project in order to take care of one aspect of the project. Coming from different departments and background, they all had their own opinions on what Caesar should be and how it should be accomplished. Though the different areas were strictly separated from each other, the boundaries were difficult, and the complete concept was to be agreed upon by all the core team members. So, even though they had the final word in their area, a lot of the decisions came on the boundaries. Several of the topics around the concept continued to surface throughout the period. It was obvious that the different members had different and sometimes conflicting goals, but at least it seemed that they all wanted Caesar to become a success. They had different perspectives on what they were creating, and it seemed that they were never able to agree on one single way to look at Caesar. Presenting the project, they all gave a different picture.

Some of the conflicting viewpoints also ended in emotional, personal conflicts. The "violent" meetings could include loud disputes between two or three of the members, with person characteristics and harsh remarks. Despite this, there was little or no consciousness about the conflicts and the way they were or should be tackled. The cooperation and the relationships were rarely discussed. The exceptions were when the project manager asked people to calm down and to be sensible for the sake of the project's health. That is, the amount of meta-communication was low.

There were also a great deal of things happening in the "back room", by implicit understanding between two of the members, or agreements made during a dinner or another social event. A standing expression was "to play chess or bridge." This referred to hidden messages going back and forth over the table intended to be understood only by two or maybe three people. One person even claimed that the most important decisions were taken after one or two pints were consumed. Agreements about reciprocal support, or how to handle a matter, or what to support were probably the most common decisions taken during social arrangements. There were often discussions about the project during dinners and late evenings, and the importance of these discussions should not be underesti-

mated.

Another interesting thing was the apparent lack of intensive collaboration. Mostly the team members did something, normally a partial product or a prototype, a report or something similar, and presented it to the core team. This was done either by sending an email message with or without attachments or by presenting it on a core team meeting or one of the RPP weeks. The others then gave feedback and they discussed the solution, and maybe suggested a few alternative solutions and ask why they have not been chosen. This seemed to be rewarding to the core team members, they had the individual freedom, but also a critical audience. This form of collaboration was not as intensive as when you sit together, because new reports or products went back and forth over several core team meetings. But it proved to be a valuable method of interchanging ideas.

One specific occurrence exemplifying this was the development of an important opening screen of the product. The person responsible for this opening screen sent a sketch of the screen as an email attachment. The receiver looked at it, showed it to his colleagues working in his team, got their feedback, and then called the responsible person. They discussed the picture while both had the sketch in front of them on the screen, . The final opening screen was heavily influenced by this talk.

Another special thing about this episode was the receiver's enthusiasm about the suggested opening screen. He was very positive and gave a lot of compliments in addition to his suggestions for improvements. This was characteristic for the whole core team (although different from person to person, of course), the enthusiasm for what they were doing and the belief that the product was extremely useful for those it was intended for. The creativity and openness for new and different solutions were also exceptional. This may have a connection with a decision made early in the project: Despite Statoil's use of Lotus Notes, and lack of use of web-technology at that time, they decided to use web browsers as the basis for their product. Later Statoil decided to rely a lot of their information on an intranet/web solution, and the Caesar team perceived themselves as pioneers, and the Caesar project as a daring project which should investigate in the use of new technologies.

### **The interchange of email**

After gathering the email which had been exchanged between the core team members, I had 328 messages in one single database. As I wrote in chapter 3.2.5, I analysed and categorized the messages. In appendix B you will find the details of the coding process.

In the table 6.3, you will find the different task categories, the number of

<b>Task</b>	<b>#</b>	<b>%</b>
CH-DE	13	4.0
CH-SO	8	2.4
EX-PE	153	46.6
EX-PO	1	0.3
GE-ID	8	2.4
GE-PL	113	34.5
NE-IN	12	3.7
NE-VI	26	7.9

Table 6.3: Email categories summary

messages in each category, and the percentage.<sup>3</sup> 43 of these messages had attachments, or 13.1 %. The codes are explained in detail in appendix B, but with the introduction to McGrath's task typology found in chapter 4.5, it should be easy to understand. Here is a short explanation:

- CH-DE or choose-decision. This is a decision task where no correct solution exists.
- CH-SO or choose-solve. The task is to find a solution to a problem where there is a right answer. In this case we are most often talking about technical problems.
- EX-PE or execution-performance. This task included messages concerning the production in the project. See later for the sub-classes.
- EX-PO or execution-power. This is a task where competition is visible. There will be a winner and a loser.
- GE-ID or generate-ideas. Includes all the messages where suggestions or creative ideas occur.
- GE-PL or generate-plans. This category is used for messages handling the planning of arrangements, meetings, etc. See later for sub-classes.
- NE-IN or negotiate-interest. NE-IN messages are messages where a conflict of interest is evident. Normally this occurs when it is difficult to arrange things in a way that will satisfy both parties.

<sup>3</sup>The numbers will not sum up to 100%, as some messages were classified in several categories as their content corresponded to several tasks.

<b>Task</b>	<b>#</b>	<b>%</b>
EX-PE-RE	10	7.2
EX-PE-EX	50	32.7
EX-PE-IN	48	30.7
EX-PE-CO	15	9.8
EX-PE-OP	33	21.6

Table 6.4: Execution performance summary

<b>Task</b>	<b>#</b>	<b>%</b>
GE-PL-FO	53	46.9
GE-PL-IN	28	24.8
GE-PL-OR	30	26.5

Table 6.5: Generate plans summary

- NE-VI or negotiate-viewpoint is a category where, in contrast to NE-IN, the persons involved see things differently, have different perspectives, emphasize different things, but where, in theory, one party can convince the other if the arguments are good enough.

As you see from the table, the generate plans and execution performance tasks were the absolute largest, and I categorized execution-performance into the following sub-categories:

- RE or request for information.
- EX or external communication.
- IN or information giving.
- OP or comment or opinion.
- CO or request for a comment or opinion.

The summary of the execution performance category can be found in table 6.4. The summary of generate plans is found in table 6.5. The codes are the following:

- FO or formal meeting.
- IN or informal meeting.



- OR or organization of arrangement. Normally this was a follow-up on an earlier FO or IN message, or about other types of arrangements.

All the messages were categorized according to the first eight task types, and subsequent coding consisted of more specific coding within the EX-PE and GE-PL task types.

In addition, I coded messages in two categories called ME for meta communication and MØ for meetings. In this context meta-communication is comments either directed towards the communication itself or towards the relationship between the correspondents. Of the 13 messages (4.0 %) in the ME category most of them were of the type "hope you are alright" and "good luck", and only three were directly related to the communication. In the MØ category 7 messages (2.1 %) included either an agenda or minutes of meeting from a core team meeting or one of the extended core team meetings. Some of the messages were automatically generated on request from ESOP, some had attachments, others were plain text. Two messages concerned core team meetings, one was an extraordinary meeting.

From these 328 messages, I found three threads of continuous communication. I followed these between the different media, but before going on to these threads, I will comment on the numbers above and on some interesting characteristics of the email communication.

What is most visible, is the fact that the execution-performance and generate-planning categories together hold 81.1 percent of the messages. That is why it was interesting to delve deeper into these categories. For execution-performance, five sub-categories emerged and gave some more information. 50 messages were to people outside the core team; these could be customers, users, consultants, managers, and others. These messages are not of any interest, but the 48 messages or 14.6 % of the total number of messages are of more interest. They were all information of some sort. Either requested by the recipient or on the sender's initiative. When we compare this to the number of requests for information, we find that only 10 messages contain a request. This means that probably 38 messages were sent to inform the recipient about something she never asked for. But I did never hear complaints that there were too many messages going between the core team members.

When looking at the requests for an opinion, there were 15 of them, while 33 comments were made. This means that about 18 messages commented on something without being a reply to a request for an opinion.

Looking at the sub-categories of generate-planning, we see that 53 messages are concerned with formal meetings, and 30 with the organization of a meeting or arrangement already agreed upon. Only 28 messages were about informal

meetings. Can this mean that there were more formal meetings than informal? Or are the informal meetings arranged by phone or simply by "popping by"?

Looking on the main categories again, there are few messages concerned with decisions. Of the thirteen messages, most of them were either follow-ups from earlier meetings or minor decisions. One is interesting to note: Person A wrote a pretty long message with a lot of topics. Person B responds, comments on one specific topic, and asks for A's opinion on the consequences for different solutions. He also explicitly tells him to keep it for himself. B responds, but a decision is not made. I know from my observations that in the end there was no need for a decision. But if the decision was reached, there would have been no way for the others to know it, except from being told by the involved. How many of the conversations in an organization, both using email and telephone, are "silent"? That is, only known to those involved?

The negotiation class, consisting of 38 messages counting both conflict of interest and viewpoint, was a considerate contributor to the amount of messages. 38 messages out of 328 constitute 11.6 percent of the total messages. This is only ten less than the information giving messages. These messages were characterized by the same interaction as face to face arguments. The pace was of course slower, but the negotiation messages created the most long and continuous exchanges of replies. Normally, there were only one message and an answer, maybe a third message going back again. The negotiation messages often created a series of messages, some directly related to the initial message, some only partially related, some between the involved, others to people who then became involved.

Looking at the messages as a whole, a few things become clear: Attachments were important, with more than 13 % of the messages including one attachment or several. It seems that the possibility of attaching files is the single most important feature of the email system, except from being able to write to each other.

An important obstacle for a smooth conversation seemed to be the lack of support for contextual writing. Notes has the possibility of including the whole message you are replying to. This was often done, but normally as a tail at the end of the message. On a few occasions colours were used to comment directly in the previous message, ending in the use of three, four different colours. Using the sign '<' in the beginning of lines from the last message, '<<' for the message before that and so on (the Internet way of doing it), was not possible in Notes.

A last thing that is interesting, is the number of copies and blind copies. Normally, copying someone on an email was the rule. Blind copies were used sparingly, but I probably did not catch all of them. Still, I do not think they were used much; forwarding of their own and others' messages was more used. Often, copies went to managers and other people who had been in touch with the topic, problem, or whatever it was. This was also a way the project manager was kept

oriented.

### 6.5.2 Three threads

Each of the threads of communication I am going to describe here has the following characteristics: a topic was going over some time span, it spanned different forms of media, and it had some kind of importance to the group. I will here handle each thread separately and describe the topic of the thread, the development of the communication, and the context. Simplified versions of the graphs I created will also be presented. In the next chapter I will discuss the interesting aspects of these threads in more detail.

#### Workflow modelling

The first thread is probably the simplest of the three, and spanned thirteen days from the topic came up until the subject was resolved. The topic was actually divided into two. One part of the Caesar project was to model workflow. The team had started looking at one software package for modelling workflow and prepare it for web. The discussion going on in this thread concerned whether they should go on testing this tool further or look for something else. But, it was also something also going on. This was in the border area between their responsibility areas, and they were trying to establish who had the responsibility. They had three solutions: either A took the responsibility, or B, or they avoided the work altogether. Temper was about to enter the discussion, but cooled down again. This way it never became an emotional conflict.

The main features of the episode are the following (see figure 6.3 ): There has been a continuous discussion on workflow and how to incorporate it into the product. Having discussed this in a core team meeting, they decide that in order to get progress on the issue, John gets the responsibility for writing a specification for the "functionality / interface / propriety" of the workflow software. He also agrees to create a specification of the technical integration of workflow and the other elements on the web. This was day 1. On day 2, John sends a long email message with a specification pertaining to the workflow software, referring to the meeting the day before. He starts his specification with the heading "Work distribution in general." In this section he writes:

*"The normal when distributing responsibility for results, is that each manager must agree to take the responsibility for start-up and planning of all activities belonging to it. (Here we all are sinners, as the project really does not have the time to plan anything) The main*

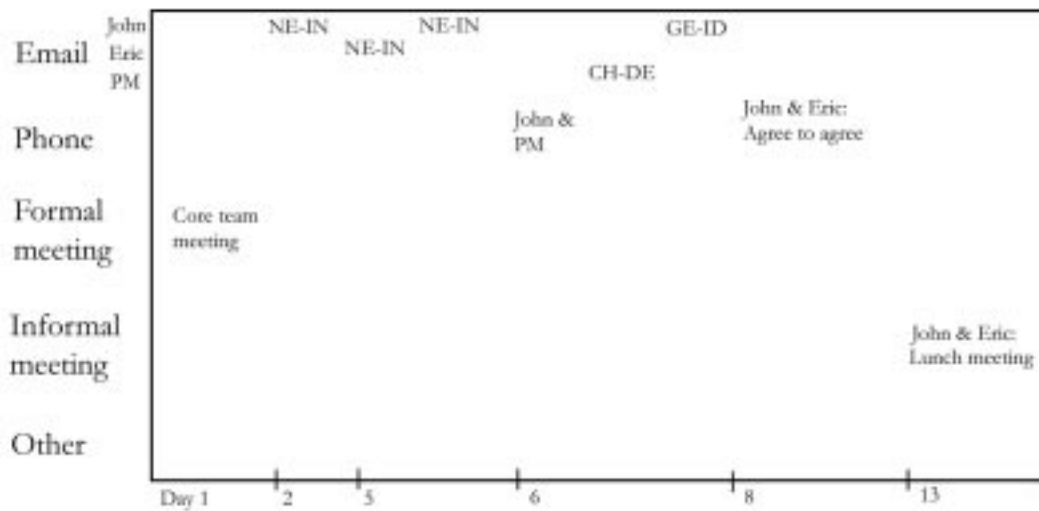


Figure 6.3: An overview of the workflow modelling thread.

*point is anyway that one must clarify who is responsible for producing an expected result.”*

A couple of sentences later:

*”If Eric is of that opinion that he shall not have the result responsibility for workflow, it is my question whether the project organization was wrongly created from the beginning. The partial project should anyway be brought to a sensible end with a usable result within the limits of the pilot, and in my opinion this is within Eric’s mandate.”*

This message was to Eric and the project manager and was sent Friday afternoon. Already at half past eight the following Monday an answer is sent. Eric opens with: *”I thank you for the input. There is something grating in our form of cooperation.”* He writes that there is no talking about letting the responsibility go, but he is still expecting the specification of the integration. He refers to *”n suggestions”* from him and his team.

One hour later John responds and agrees with Eric on the grating, and further writes: *”It is therefore an advantage not to provoke in all situations, in that you are then risking to obscure the real message with something different (unessential).”* He is here referring to a tendency to provoke which Eric often showed. John continues by stating that the specification will be sent as soon as it can be presented, and he presents a few ideas which he calls *”drops.”* These two latest messages have also been copied to the project manager.

The next the day the project manager sends Eric a message. He has talked with John, and is summing up in three items what he thinks should be the conclusions on the demands for workflow. His last item is: Shall we go further with the workflow software in question? This question is never answered by email, and as far as I know, not by telephone either. This may be because of the message sent by John already thirty minutes later: It is his specification, or design suggestion as he calls it. The whole core team and the users are the receivers.

Two days later, and one week after the core team meeting, John and Eric have a discussion on the phone. Eric says afterwards: *"John is agreeing with me. He agrees on that we should leave the modelling of the workflow to [external consultant]. He is scared to death of having more work to do!"* Six days after this again, they meet because of an arrangement and have lunch together. Already having agreed to agree, they discuss the matter (in "dependent clauses", as they say), and afterwards they both agree they are "in line", or having the same opinions in this question. During the core team meeting the next day the workflow issue is not raised.

### **Danger signals**

This thread was going over eleven days, but with a more intense communication exchange. There are three phases of development: First, everything is started with an email with four items where Eric sees problems in the project's progress. Then several messages go back and forth. Second, this stops and almost a week passes with messages concerning the arrangement of an extraordinary core team meeting. Third, the core team meeting is held where all the four items are discussed in one way or another. (See figure 6.4 for an overview of the thread)

A core team meeting is the background for this thread. Three of the core team members decide, while the others have to leave to catch planes, to postpone the RPP II week and set an agenda for it. This triggers Eric's message with the subject: "Danger signals, an input for discussion." This is one week after the core team meeting, and early that day Eric sends a message concerning a meeting, and adds that he later that day will send a message with a "well-founded message" based on the development just happening in the project.

The danger-message itself has four items and starts with a question: "Are we far out in the country, and are we blended by an imagined success?" The items are concerned about his thoughts on what the product is becoming, the representativeness of the users represented in the project, the consistency of the concept, the project's move into production phase, and the consequences of postponing the RPP week.

The danger message goes to the project manager, but he has discussed it with a colleague first. Just one hour later the reply is received. The project manager

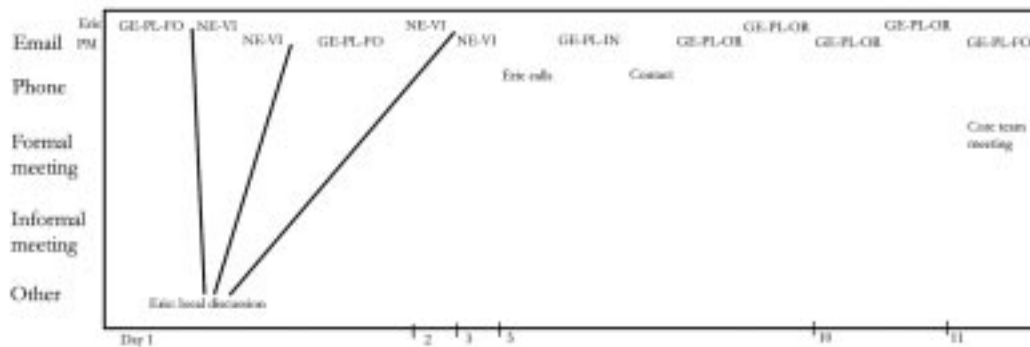


Figure 6.4: An overview of the 'danger signals' thread.

writes:

*"Personally I feel it unnecessary to agitate the situation by using words as "danger-signal". Except from that, I agree with you that it can be smart to think from time to time. When that is said, it is those in the project that need quietness in order to get something produced. We must be good at meeting the different needs, without maximising the situation into a crisis. Below I have tried to comment on your thoughts the best and the most sincere way I can, without (again) taking into account the grand schema of the Grand Master. I will also send an invitation to a workshop for the core team the [date], since the time until the next RPP will be too long."*

Further down in the message, he uses red colour to comment on the different items. I will not refer the details of this answer and the subsequent messages. But it is sufficient to say that when I compared their understanding of each others messages, they did understand only parts of the intentions behind, and misinterpreted others. The project manager said later he felt that the message had been unclear and difficult to understand. But he thought Eric felt slighted because of the decision made to move the RPP II week. Although asking for a clarification, their own interpreted views were still presented in the messages and became the basis for the next reply. The project manager's answer was quickly followed by a call for a core team meeting. The next day Eric answered, and the following day the project manager replied to Eric again. The number of messages were now altogether six. Two days after the last reply from the project manager, a Friday, Eric tries to call the project manager, does not succeed, and the project managers writes back: *"I have tried to call back."* Later that day they finally get in touch,

but do not discuss the email conversation, but the organization of the core team meeting.

At the end of that Friday and the following three work days, five email messages go back and forth concerning the organization of the meeting. Eric is not able to fit it into his schedule. He concludes that he will not be available, but that a consultant will come as his representative. On the day of the meeting, two hours before it is scheduled, the project manager sends out the agenda for the meeting. (Probably three of the core team members did not receive the agenda before the meeting.) There he has included an item called "*items the individuals would like to discuss*", including "*critical processes that may reduce the progress of the project*" and "*RPP II*".

In the middle of the meeting, Eric shows up anyway. The project manager is reluctant to let him speak freely, but during the hour Eric is there, he manages to discuss all the four items he had raised. He is heard, what he brings to front is not too controversial. He gets support for his opinions, and for his suggestions for some new initiatives in order to keep the creativity and openness going in the project.

The day after the meeting, the project manager is visiting the offices where Eric is located. They have an informal meeting. They do not discuss the danger signal thread or the core team meeting the day before.

### **Emotional conflict**

The last thread was the longest and the most difficult. While the other two can be categorized as NE-VI, that is, conflict of viewpoint, this was more a NE-IN, a conflict of interest. The thread can be seen as two different conflicts. The background was that one of the core team members was the project manager of a smaller project working in an area Caesar also saw as important. I call him Fred. After some discussion, he agreed to include his project in Caesar and become a core team member with responsibility for that same area. One conflict can be seen in his relation to the Caesar and the rest of the core team. This conflict was not explicit, but grew larger as time went and no product or results in the area of Fred's responsibility showed up. In the end, he dropped silently out of team, much to the ignorance to the others, as he had contributed with nothing anyway.

The other conflict went parallel with this, and was between Eric and Fred. This conflict was highly emotional, and ended in a reconciliation meeting where they agreed on a "piece agreement". This was closer to agreeing on each person's territory than to a peaceful coexistence. The conflict started out from a border area between Eric's and Fred's responsibilities: how to model workflow (the methods, not the software this time). The length was twelve days. The larger conflict however, was several months long. (See figure 6.5)

There had been some common history in past. They knew each other from before, and Eric was suspicious. He did not like the inclusion of Fred in the core team. He did not trust him, and besides Fred was arguing for an approach to workflow which Eric meant was fundamentally wrong and which had been leaved a long time ago in the Caesar project. After a core team meeting with some quarreling about this<sup>4</sup>, he checked the financial report sheet of Fred's earlier project<sup>5</sup>. There he found that a colleague just down the hall and himself were listed as contributors to the project without their consent and knowing. He raised an alarm, to the project manager in an email, and to his colleague and his manager just down the hall. The result of this was a lot of fuzz in the departments, including managers, Fred, Eric, and the Caesar project manager, but I will just concentrate on the core team.

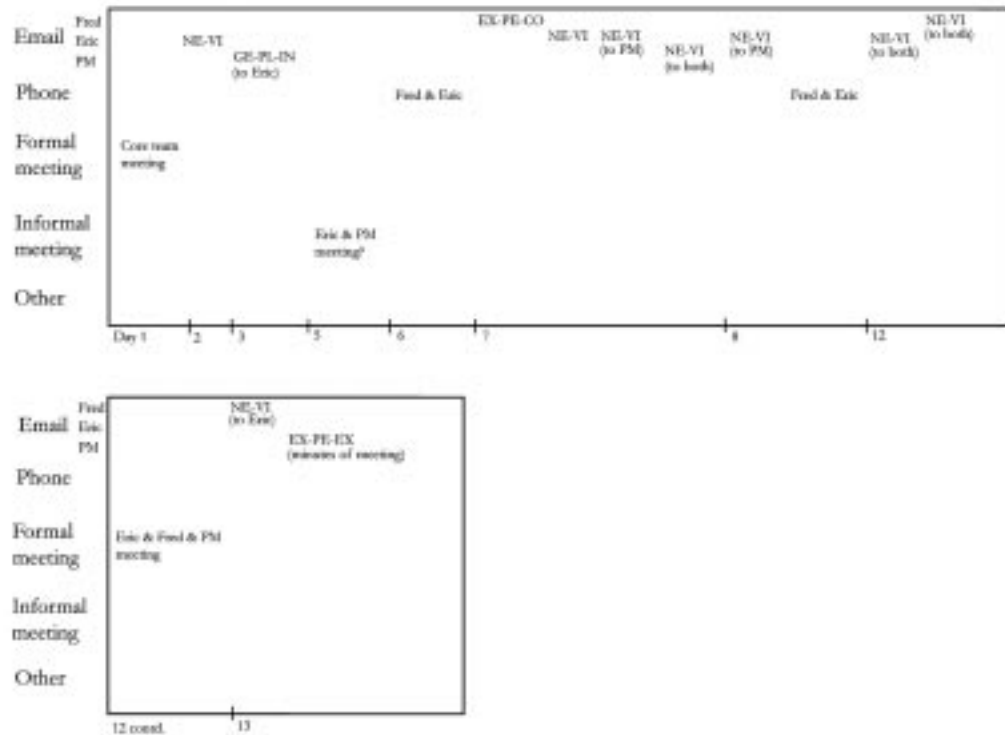


Figure 6.5: An overview of the emotional thread.

The day after Eric's first mail to the project manager, the manager suggests a meeting two days later to discuss things, just the two of them. They have

<sup>4</sup>Fred's first core team meeting.

<sup>5</sup>These sheets are found in a Lotus Notes database.



the meeting, but I do not know what they agreed on. The next day, Eric and Fred talks on the phone about the work that Fred is supposed to do in the Caesar project. Eric cannot see how it is possible to do all the work Fred promises to do, but *"he seemed willing enough."*

The following day Fred sends out an email message to three of the core team members, among them Eric. Fred suggests that Caesar uses his old project's way of looking at workflow as a start, and that time is running short. Eric responds violently in a reply to the same persons, and the person who was responsible for workflow in the project mentioned in this citation:

*"This is it! Those of us who are working in Caesar are not served with this communication form that Fred is setting up. The start for all discussions about functionality in Caesar is [name of related project]."*

And half an hour later, Eric is sending a message to the project manager complaining about Fred: *"He is a nuisance."* Later that evening the project manager asks Fred and Eric to come to his office and have a *"gathering at the bottom"*, that is a meeting, all three of them. It is Wednesday evening, and he suggests the following Monday. Early Thursday morning, Eric responds with a message making jokes about the project manager as a peace mediator. Monday morning, Eric sends a message to the project manager and Fred:

*"I am going now.  
Only two things.  
I do not want to discuss history at the meeting.  
I do not want to discuss technology at the meeting.  
Accordingly, we must discuss forms of cooperation, that is my opinion!  
Eric"*

Fred follows only twenty minutes later with a suggestion for a limited involvement for him in the Caesar project. This includes not being a part of the core team, only concentrating on his specific area, and keeping away from Eric. They have their meeting, where Fred's responsibility area is made more concrete; he will still stay in the core team, and the money from his old project is following him into Caesar. The minutes of meeting is written by the project manager and sent to Eric, Fred, and their supervisors. Fred writes an email to Eric only and demands that he in the future does not refer to Fred's statements without asking Fred or another who have heard the statements about the correctness of the referred statement. He also says that he is finished with the subject.

After this, Fred is rather careful in the core team meetings when Eric is there. It is after this he slowly fades away and disappears from the core team. Fred and Eric do not have any further email conversations, only one message is sent, and it is concerned about some details on arrangements for a core team meeting. It is clear that conflicts are now tried to be avoided, and messages earlier sent to everybody in the team, but that might cause a restart of the conflict, are now not copied to all, unless it is absolutely necessary.

### **6.5.3 Summary**

These three threads show three different situations that often occur at a work place. The first, work-process modelling, is a conflict of both interest and viewpoint, where neither were very deep, and the persons involved already had a relationship based on trust. They were able to find common goals, and to end the conflict. The second, danger signals, is a conflict of viewpoints where an open and lengthy discussion revealed that the difference in opinions was maybe not that large anyway. The third, emotional conflict, was complicated. There was history shared by the involved, they had different interests and viewpoints, and the relationship was weak. All this was weaved together in one mass where it was difficult to part one thing from another. I was told that conflicts like that, when managers were involved, can very likely cause the death of a project like Caesar. (See also the discussion on politicking on page 77)

# Chapter 7

## Empirical Discussion

*In this chapter called 'Empirical Discussion' I will take a closer look at the case presented in the last chapter. I will discuss the email communication, and then the three threads. I will interpret the empirical data and discuss the interpretations. Then I will take a new look at the interviews and how they reasoned about choosing communication tools and compare this to the three threads. What can we find? The following section I will connect the findings of the communication with the organization of the project and the Statoil organization.*

*This first part will not include much theory; I discuss the findings as they resulted from analysis inspired by theory from my conceptual domain. One of the main conceptual bases in the analysis was the time, interaction, and performance (TIP) theory. I turn closer to theory and look at how this theory can shed light on the case. Finally, I visit the task-medium thinking again. I now ask: fitness, are you there?*

*While this chapter concentrates on discussions having a direct connection with the findings, I will in the next chapter discuss theory in more general.*

### 7.1 What can the email communication tell us?

The email communication was gathered in a common database, and in chapter 6.5.1 I presented some tables and observations based on this email database. Here I will present some interesting aspects and interpretations of them.

A few things were not very unexpected, but worth mentioning. Most of the messages were found in the categories containing external communication, information exchange, and planning, but this is hardly surprising. Email is known from other studies as a great tool for planning and organizing. And Notes has for a long time been used in Statoil as a medium for exchanging documents, plans, minutes of meetings, and so on. The perceived "safeness" of reaching some-

one using email is also pretty obvious when the organization demands the use of email.

That email is not much used for idea generation and tight collaboration is neither a surprise. The lack of interactivity and the speed in the turn-taking are important factors explaining this.<sup>1</sup> The number of messages concerning formal meetings were almost twice the number concerning informal meetings. As far as I know, this has not been studied earlier, but the character of informality suggests that this is no revolutionary discovery. Normally, you should think, an informal meeting is spontaneous and not planned on beforehand by email. Then it is more interesting to see that email actually **is** used to arrange informal meetings by sending messages like "Are you there on Monday?"

The 11.6 percent negotiation messages will probably not surprise those working with flame wars. [Siegel et al., 1986] But these messages were not flame wars. Actually, they were not more aggressive or conflictual than the face to face communication observed, maybe rather less. Why have I not found a higher level of aggression in the email conversations, like in other studies? It is difficult to say, but the persons involved knew each other well, and knew they had to work closely with the others for a long time. They also often met. This can be one of the differences found when studying real groups with history, context, and future, but unfortunately being a case study, it can also be this particular group where the normal level of conflict was abnormally high in face to face settings.

Another interesting thing is the lack of contextual writing. That is, with a reference to the statement you are commenting. None of respondents expressed any irritation of the way Notes handles this problem. Though I found that the communication was limited when the issue grew more complex, as it was difficult to discuss several things at the same time without referring to sentences in the message being replied to. They did use colours a few times, but they could have done it more often. Can it be that this Notes feature or lack of features when it comes to contextual writing actually was a factor contributing to the use of the phone or personal contact when the matters became more complex? It is impossible to know, but it would have been interesting to introduce the possibility in Notes and train the core team members to use it, and then see what happened to the decisions and the complexity of the matter discussed in email messages.

Earlier I have commented on "silent" conversations and decision. Email enables a conversation going on between three or more people over a longer period of time. This is not possible, or at least difficult, without email. It is also possible to make a decision. And nobody will ever know if the involved do not say

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<sup>1</sup>It might be the collaboration was more frequent than I have been able to observe. The possibility of using the prototype on the intranet and discuss it on the phone could very well be happening without my knowledge. Though this was never mentioned during the interviews.

anything. It was possible before, with telephone, to make a hidden decision with two people involved, but not involving several persons. Email extends this way the possibilities of silent communication, which may be used manipulative by the some people. The same can be said about the use of copies and blind copies. I reported on a large number of messages being copied to those involved, and those who should be oriented in the senders opinion. It is not sure that the receiver agrees to this opinion. Using copy, blind copy, and forwarding are extremely effecient ways of giving information about what is happening, and it can be used in both positive and negative ways.<sup>2</sup>

## 7.2 What can the threads tell us?

In this section I will handle each thread sequentially, like in the last chapter. I will point out the aspects I find interesting, and offer alternative interpretations. The nature of this study does not allow me to conclude, but where I find an interpretation more likely than another, I will mark this.

### 7.2.1 Workflow modelling

The workflow modelling thread never became an emotional, personal conflict. How come? The tone was sharp in a couple of messages in the beginning, but instead of the conflict getting more intense, the emotions cooled down, and became more professional. It might have to do with two things: First, they had a close relationship and a respect for each other. This can cause them to think twice, and try to understand the other person's point of view. Eric showed some of this in his comment on John's motives (afraid of more work). The direct and open communication even included a rare remark: meta-communication. John commented on Eric's provocations and suggested a reduction of this behaviour. Second, the conflict area was limited and clearly defined. They had the possibility to state that: we disagree on this, but normally we agree.

Of course, there can be other reasons too, but this is interesting to contrast to the numerous studies reporting on "flame wars" and escalating conflicts in the use of email. [Siegel et al., 1986] Most of these studies report on discussion databases where the participants do not know each other well, on experiments with undergraduates, or they do not say anything about the relationships between the subjects.

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<sup>2</sup>Another problem is the overwhelming amount of messages that especially managers may receive because of this praxis. The platform managers on one platform warned that the work connected with their email communiation was so time consuming that they feared that it might influence the safety onboard.

Another thing is that John and Eric had face to face communication as an alternative. Flame war participants have not often got this possibility. The conflict started after an email motivated by a meeting, and it also ended face to face. Having a close relationship, used to understand each others non-verbal language, they might have felt that this issue should be discussed in person, in order to be discussed properly. But we see no sign of this being done consciously, like a comment such as "Let's take this next time we meet."

Or is it habits that governs how different situations are handled, and which caused them to meet face to face? In social psychology something called 'scripts' has been given some attention. A script is a predefined conception of how the layout of a certain situation should be, and the elements in it. These scripts are used when we interpret situations. But salient or unusual attributes of the situation can make us become more conscious of our expectation, and we might even leave the script. [Sabini, 1992, p. 205] Here John and Eric could have had a script saying that conflicts not solved instantly should be handled face to face.

Going back to John and Eric's relationship: Maybe they had some kind of unspoken agreement that things like this should be handled face to face. That is, a pattern of action triggered by the interaction with the other, or if you like, an individually adapted script.

I find all these interpretations to be interesting, and I also think the concrete situation, relationship, history, and culture influence the salience of each factor.

A last interesting aspect to note, is the fact that a third person, namely the project manager, was kept up to date of what was happening and was able to influence the situation by asking the question about going further with the workflow modelling software. If the conversation had been going on telephone or face to face only, the project manager would probably not have known anything about the dispute. At least not before it was resolved, or when and if John or Eric told him. It is obviously important to managers to be informed about such things, especially if things go awry.

Let us have a look at the situation and try to imagine what kind of underlying assumptions John and Eric had, it may prove interesting. As said earlier, they had probably an intention of keeping their good relationship; that it was important to keep. Then most other matters would be subordinate.

I mentioned earlier that they might have felt that the issue should be resolved in person. They communicated for a while using email. John sent long messages with specifications and comments, while Eric sent responses to these. But at the moment there were no more long specifications or messages to write, they had on telephone conversation. They did not settle the issue completely, but reached a tentative agreement. Finally, they met, and finalized the discussion. Underlying this set of events and the feelings mentioned, can be the belief that face to face communication was needed to make sure they reached an agreement

they both could live with, and that email was well suited for documenting the different opinions and "laying the ground" for a discussion. This again may be caused by the perceived lack of non-verbal information in email.

### 7.2.2 Danger signal

The danger signal thread started with an email and ended in a core team meeting. The conversation went by email for a while, and the temperature was raising. The messages went straight on business, with almost no "wrappings" or explanations. The email medium is not rich on backchannel and non-verbal communication.<sup>3</sup> There were clearly misunderstandings, and the issue was not discussed between the involved on the phone, but was introduced as a separate item on the agenda for the next meeting.

Why do these misunderstandings occur and why do they persist during further email conversation, but are solved when discussed face to face? Several theories exist: lack of interactivity, lack of social presence, de-individuation, lack of social context cues, and media richness. What is clear, is that the rate in the turn-taking of the communication is low. A message is interpreted by the receiver despite his expressed problems of understanding the message. He asks for more information, but also in the same breath, he presents his interpretation. Upon receiving the reply, the interpretation and not the information request is perceived saliently, and another reply is written without offering clearifying information.

Both the lack of social context cues and media richness can explain this, but what is really happening? Interpretations are made on the basis of very limited information. Why is the conversation not stopped, and more information sought? From what I see, I will say that it is because the receiver **believes** he knows, at least partially, what the sender meant, and enough to write a reply. It seems that when there is not enough information available in the message, the receiver's knowledge about the sender and their history become more important and is used to interpret the message. The evidence indicating such an interpretation is scarce, but the idea is interesting. But this does not explain why more information is not sought. Here it may be that the lack of interactivity has an influence. But why not pick up the phone and call the other person? I know that both the project manager and Eric were in their offices while exchanging several messages on at least one day. Are we talking about scripts again? Or is it a tendency to keep a conversation in the same medium as it started, and that leaving that medium requires some "effort"? Or have these hasty interpretations something to do with

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<sup>3</sup>Non-verbal communication is normally used about positioning, face gestures, and such physical attributes. Backchannel information is the information found in voice, tone, pronunciation, silences, etc.

the fundamental attribution error<sup>4</sup>? It is not possible to conclude with my data.

Another interesting thing is that in the 'danger signal' thread, they mostly replied to the parts or details of the messages and not the message as a whole. It seemed that each of the statements were interpreted and replied to as full meanings and not in the context of the whole message. Why this is so, I do not know. It seems that an email conversation quickly is perceived as several separate discussions going on at the same time. The messages in this thread were among the few with the use of colours, while normally the whole message will be attached and the reply written in one continuous text. I did not find concurrent discussions in the same message in such conversations. (But true, in these there were often only two or three replies)

When the issues were discussed at the core team meeting, the conflict faded away. It turned out that the differences in opinions were not that large anyway. Would all this have disappeared after a face to face communication between the project manager and Eric if they had offices close to each other? If Eric got support for his opinions right away? Maybe, and it would then have been another of the "silent" conversations.

Which assumptions can be imagined underlying the observations in this thread? First of all, Eric must have found email a proper medium for writing this serious warning. He could have used the phone, but he did not. Second, the matters brought forward must have been perceived to the project manager as important to the whole core team, as they were not discussed any further on phone, but was discussed at the next core team meeting. It may also be because it became so complicated and difficult that a face to face meeting was needed. And the next face to face meeting between Eric and the project manager was the next core team meeting. Or was it because the project manager found the matters to be a potential source of future conflict and needed the rest of the core team to "handle" Eric, to put him to rest so to say? This is an example of how difficult it is to interpret a real life situation like this.

### 7.2.3 Emotional conflict

This conflict was based on history, personal relationship, and a lot of other factors. It is difficult to analyse conflicts like this. Catching all the different aspects is almost impossible. I will not try to completely understand what happened and why, but I will try to point out a few things concerning the communication which went on.

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<sup>4</sup>The fundamental attribution error is a tendency people have to attribute other people's actions to their inherent personality or traits, while their own actions are attributed to contextual factors. [Sabini, 1992, pp. 191-197]



It is interesting to see that all the available communication media were used: email, telephone, informal meetings, and formal meetings. While the other two threads were resolved the first time the involved had a possibility of speaking to each other in person, this did not happen here. Managers had to be involved in the conflicts, both as mediators and for pressure. And the conflict did not end, but was just put asleep. As one of the respondents remarked, it might be that distance can make continued work possible in a project where two members have a conflict. This way the two can be shielded from having contact.

It seemed that feelings and the personal conflict were hidden in the email conversation, if you compare with the face to face communication. This might be because they often copied other persons and managers. Most of the messages were sent with the project manager as the receiver, while the other person received a copy. These two things show a distance to the conflict that also was evident in the fact that to my knowledge the underlying personal conflict was not discussed. It was a focus on the formalities, or the "content" of the conflict if you like. An exception from this is an email from Fred to Eric and the project manager where he is referring to their "*non-matching communication forms*."

The copies to different people, their own managers, and the project manager made the conflict public, and it seemed that some of the messages were used to "make statements" not meant to be a contribution in a discussion, but to influence the opinion or decisions of managers and others who received a copy. It also seemed to worsen the conflict, and that "doing the laundry in public" strengthened the impression of evil blood between them.

This conflict seemed to be both a personal and a political conflict. Fred was fighting for the life of his project, while Eric was fighting for his view on workflow (which was very important to him). It is difficult to say whether the use of email for communicating in sum was positive or negative in this situation. But it is certain that the manipulative use of email to inform others and to make a public conflict did not contribute in a positive direction.

#### 7.2.4 Summary

The different threads were all completely different situations. The relations between the participants were different, the topics were different, the complexity, the path of development, and also the solutions were different. It seems that the best way of solving a conflict is to meet face to face. But as we all know from everyday life, even this is not always enough.

Summarizing the analysis of the threads and thinking a bit freely, we get the following suggestions about sustained communication and email in particular. The order is random:

- the turn-taking in the communication is slower than in face to face communication,
- an abnormal amount of trust is put on scarce information,
- the details become important and it is easy to lose the overview when communicating by email,
- ways of communicating may be adapted to the recipient,
- knowing another person's non-verbal and backchannel language may cause you to feel more deprived of it when communicating using email, than if you had not known it,
- it does not seem that telephone is of more help than email when it comes to solving a conflict,
- face to face communication is probably still the best way of solving a disagreement or conflict,
- email opens up for a new way to keep others informed,
- email opens up for more "efficient" and extended use of "hidden" or "silent" decisions and conversations,
- it is not clear to people when to stop an email conversation and change into another medium in order to avoid misunderstandings,
- a good help for "successful" communication from a distance is a good personal relationship between the interaction partners,
- communicating efficiently and without face to face contact when working closely together may be extremely difficult, and
- there are present both will and skills for politicking and manipulation using tools for communication support.

These items are by all means not something I consider proved, but these ideas can be interesting to study further. Let us have a look at the way the three respondents reasoned about communication compared to the observed behaviour.

## 7.3 Comparing reasoning and observed behaviour

Having looked at the email communication and the threads, it is time to look at how the communication observed compares to what was said in the interviews. The summaries of the interviews can be found on the pages 89 and 94.

Let us first take a look at how their reasoning about communication can shed light on some of the observations. One example is the CH-DE, choose-decision, category of email messages. There were very few of them, that is, very few decisions were discussed and made using email. They all revealed in the interviews that they preferred the telephone for simple and quick decision, while face to face meetings were needed for more complicated decision. Only Peter felt comfortable using email for making decisions. The lack of decisions using email was earlier difficult to explain, but it now seems more obvious.

They also stressed the importance of good relationships and trust. The observations confirm this, although the number of messages with positive, nice remarks were only ten. It is difficult to know for sure why this is so, but it seems that their focus on relationships also includes a more positive attitude towards using telephone and social events to maintain the relationships, and not by email. Their meetings every fortnight, their social interaction in connection with these, and informal meetings may have satisfied the time needed for maintaining the relationships.

It seems that the relationship between the participants in a communication situation is very important. Earlier I suggested that one of the reasons for the development of the 'workflow modelling' thread, was the wish to keep a good relationship. I also brought forward the thought that when knowing someone close, email conversations felt leaner, because you knew what you were missing in the communication. In the interview, Eric said he had specific 'rules' for interaction for different people.

[Gabarro, 1990, pp. 83-84] lists eleven dyadic dimensions among which relationships develop. Among these are 'capacity for conflict and evaluation', 'efficiency of communication', 'mutual investment', and 'uniqueness of interaction.' These dyadic dimensions are related to the ability to express conflict and to make positive and negative remarks, the accuracy in the communication and the sensitivity to nuance, the amount of investment in the other's well-being and efficiency, and the amount of norms unique to the relationship. The closer the relationship, the higher the score on these scales. The aspects of relationships and how they influence sustained communication can be of interest for further studies.

All the respondents noted that telephone was mostly suited for quick and simple decisions or discussions. John even said he did not prefer telephone. This seems to fit if we look at the workflow thread. The phone was only used to "agree

on agreeing”, and that the topic should be discussed later on face to face. It does not seem, neither from the observations nor from the interviews, that phone is regarded as an especially useful tool. It is almost as if they could have managed without. This is quite contrary to how we normally consider telephone in our everyday life.

Eric focused particularly on the manipulation possibilities of sustained communication, and especially email. The other two did not talk about manipulation, but they were surprisingly conscious about how to choose communication form in order to succeed according to their plans: to see somebody face to face without an appointment in order to get a benevolent attitude, refraining from answering messages, use email to argue for and document your opinion without being interrupted, and so on. Yet, in the observed communication they did not seem equally deliberate and conscious. One thing is to do the opposite of what they told they did in the interview, another thing is the lack of focus on the communication situation in itself. The amount of meta-communication was low. In face to face communication we communicate meta information all the time. Sometimes explicit, like ”please let me finish”, other times implicit by voice use and paralinguistic information. Sometimes even more directly on the communication, like ”let’s use the blackboard.”

One thing that strikes me, is that it seems that they only talk about the initiation of the communication. But when they have a conversation going over a topic, the initiation is history. Clearly it is possible to be conscious about your communication choices within a communication thread, but only Eric seems to consider tactically every single situation. This is maybe not surprising, with his conflict perspective. It is rather the lack of explicit meta-communication that surprises me. The knowledge about communication and human relationships they all show, could easily have been used in order to make the communication flow smoother. We are maybe seeing the well known difference between knowing and doing. But the consciousness and use of meta-communication are probably essential if you set out to improve work communication.

Of other things in the threads we may recognise from the interviews are the use of attachments and long messages from John, Eric’s short messages and logically structured messages, John and Eric’s swap from email to a lunch meeting without trying to solve the matter on phone, Eric and Peter’s swap from email to a formal meeting when the issue is perceived as complex and comprehensive, and the extensive use of manipulation techniques in the conflict between Eric and Fred<sup>5</sup>.

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<sup>5</sup>As earlier said, Fred eventually disappeared from the core team. He was not willing to be available for my work. Hence, he was not interviewed.

If we look at the interviews, Peter said that when he got a difficult, or aggressive email, he would not answer, but think about it. Then he would either use the phone, if there was a misunderstanding, or he would wait until next time they met, and hence refrain from answering the message. He would choose to answer with an email only if a short message could clear things up, as "answers will lead to new answers."

If we look at the 'workflow modelling' thread, we see that Peter answered the message already one hour later. It was a long answer, and the message he answered was difficult to understand. Some more messages flowed back and forth until it was decided that the matter should rest until the next core team meeting. During this meeting it became clear that the matters were not so controversial after all, and Eric got support for most of his arguments. We may ask: Was this email discussion and the emotions evoked unnecessary and a quick phone call would have settled the matters earlier and without the need for attention from the core team? This is just speculations, but it is a valid questions. A conscious choice when communication tools are concerned seem to have a considerate influence on events.

This discrepancy between said and actual behaviour is a known phenomena. [Sabini, 1992] devote a whole chapter to attitudes and behaviour in his introductory book on social psychology. (chapter 17) Topics covered are when attitudes can predict behaviour, individual differences, and reasoned action. Argyris has a theory on leader behaviour using what he calls model I and model II. Model I is an espoused theory including the goals, assumptions, and values that the person claims guide her behaviour. Model II is the theory-in-use which are the implicit assumptions that actually predict behaviour more accurately. [Schein, 1988, p. 127] A vast body of literature is also found in the field of organizational learning and organizational development.

What we have seen is that the respondents agreed on a lot of matters concerning media choice, but they also disagreed on certain things. When communicating in a continuous conversation, like a thread, who "wins" the choice of medium? The person who initiated the communication? The most manipulative? The most conscious? And what are the results? For the communication? For the development of the situation? For the satisfaction and emotions of the involved? Here we know little, and we should clearly know more.

We have already seen how a situation like the one between Peter and Eric (danger signals) influenced the work of the whole project team. And this is just a single occurrence, such differences in communication preferences probably occur all the time. Communication, contact, and interaction are the basis for all organizations, and such seemingly unimportant questions may have a great impact on the organization as a whole. But that is a topic for the next section.

## 7.4 Connecting communication and organization

Differences in communication preferences have long existed in work life. People who always want a formal meeting to decide the least significant things have probably annoyed many a work companion. But with electronic communication the choices grow to many more. And the lack of non-verbal and backchannel information increase the possibilities of confusion, misunderstandings, and serious consequences.

'Connecting communication and organization' is a huge task. Here I will connect some of my findings on the organizational level and the communicational level.

I will classify the most interesting aspects of Statoil to the Caesar project's communication pattern into three: organizational structure, rules, and organizational culture. Looking at the organizational structure first, we have another four aspects: the organization of Statoil into several separate self-contained organizations, the internal market, the communication infrastructure, and the many roles an employee may have.

First of all, the different organizations and the internal market were the basis needed for the existence of Caesar. The possibility of "hiring" people from anywhere in the organization, and their ability to define their own goals and product, were essential for the diversity and creativity of the project. The diversity is probably excellent for the creativity, if you shall believe numerous books on multi-professional teams, but a problem for smooth communication, as in Caesar. The hierarchy resulting from all the result areas, units, and departments has a direct influence on how employees communicate within their own "line" organization, but less across organizations. The position is no longer of much importance to the communication as the person in the other organization is not "above" in the hierarchy, and often it is difficult to compare your positions. The important is what her area of responsibility is and which role she has, and how this is related to your work. A project like Caesar may in theory include members from any layers of the organization. (And it did, both in the core team, and among the persons associated with the project.)

The company's infrastructure and software offered are two of the things most directly influencing how the project organized its work. If Statoil did not offer a communication tool, it was neither used nor tested.

The corporate rules for project organization and communication would probably have affected Caesar. But there were not any! Most organizations in Statoil let project managers and teams organize themselves, and it is up to their knowledge and willingness to systematically "construct" a way of working, communicating, solving conflicts, and so on. Statoil has some tools to help, as I have

presented earlier, but even these are something projects have to find information about on their own. As an example we can take a project manager I asked about the use of facilitators in Statoil: He had never heard about the possibility. He had always used people from outside Statoil. And I also asked a person with twenty years of experience in the company whether he knew about rules for project organization and communication and help that might be available. He had to find out for himself before he could answer.

The organizational culture with competitiveness and politicking behaviour, and an extensive use of informal networks for both information and decisions, also clearly influences the internal communication in a project, especially when the participants exist both within their own organization, Statoil as a whole, and the project at the same time. In this situation it is more difficult to create new, shared norms and culture within the project, compared to what we can imagine in a project where the members spend all their time. The importance of networking also emphasizes the importance of maintaining relationships.

'Manipulation' has been visited several times through the case, their consciousness about using the appropriate media for getting their message through. I expressed earlier a surprise over this consciousness; I had not expected so direct, well-founded theories of media choice. This highlights the possibilities of manipulation for a person with great skills. This obviously happens in organizations without email systems too (those who are left). But it seems that the electronic communication tools make it even simpler to manipulate, and that the possible ways of manipulating have been largely extended. Imagine what a really destructive person might do! It is not difficult to pretend being somebody else in an email to a Statoil employee. There exist a lot of small computer programs which send fake Internet mail. They cannot fake Lotus Notes mail, but the Statoil employee's Internet email address can be used instead. The receiver will just assume the message was sent from Netscape or from outside the firewall<sup>6</sup>.

There has been done little research on media manipulation in organizations, and we know little. The only related research I have found is Robert Zmud who has written an article about "information manipulation through new information technology." [Zmud, 1990] He presents a model for organizational information systems with seven types of "nodes" processing the information. He presents an analysis of the possibilities for manipulation for each node type. It is obvious that manipulation behaviour can have a great impact on the organization, but the present extent and consequences are unknown.

I have here just pointed out the most obvious connections between communication and organization in the case of the Caesar project. In the next section I

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<sup>6</sup>See for example <http://hotfiles.zdnet.com/cgi-bin/texis/swlib/hotfiles/info.html?fcode=000FR2> for such a program. <http://www.myemail.net/> offers an anonymous email service on the web.

will go back to the group level again and take a look at the case seen from the TIP theory. I have chosen this sequence in order to discuss the case thoroughly before introducing comprehensive theory.

## **7.5 The case seen in the lights of TIP theory**

As recalled from the theory chapter on time, interaction, and performance theory (TIP, chapter 4.5), the basics of TIP were the task typology, the group functions, the development phases, the concepts of nesting and coupling, and seen in an organizational perspective: the four group processes of construction, reconstruction, operations, and external relations. In addition, based on these ideas Hollingshead and McGrath have developed a framework for research on sustained communication, I presented this in the chapter on a framework for understanding knowledge teamwork.

A short recapture: I used the task typology for an initial coding of the email database, and the framework as a start for collecting possible variables to study (found in appendix C) The whole TIP theory was also used as one of several conceptual inspirations and resources for the analysis of the empirical data. It turned out that TIP theory was well suited to be a framework for other sources and perspectives on the data. Trying to understand the field study from different angles is important, and I have earlier in this chapter revealed my findings almost "theory-free", though guided and inspired by my conceptual domain, in the remainder of this chapter and the next I will discuss the case in the lights of theory.

The case has already been seen in the lights of the task typology. As we saw, it was a useful tool for breaking down the email communication into classes of tasks. By counting, comparing, and doing further qualitative analysis, it was possible to reveal quite a few interesting things. I found it necessary to extend the eight task types, both by redefinition and by dividing into sub-classes. If I had coded observed communication, I would probably also have faced the need for including at least one more task type: 'socializing' (as commented on earlier). In a further study, it can be interesting to code the interaction in the core team meetings, and compare this with the other types of communication. (A system for coding face to face communication based on TIP has been developed by [Futoran et al., 1989])

### **7.5.1 Nesting and coupling**

The concepts of nesting and coupling are interesting. Several times we have touched the fact that each of the core team members was a member of several other groups at the same time. The nesting of groups was likely the direct cause



of the extensive presence of hidden agendas some saw in the Caesar core team. They had not common goals on all areas, and there was no explicit knowledge about the members' roles and goals.

The Caesar project was also part of a larger organization in several ways. The different members' departments had "an ownership" by having their employees involved in the project. This nesting is another way of viewing the influence of the members' supervisors on the project. It is also interesting to see that the project manager's boss had a special role as some kind of control authority. Caesar was started in that department and originally accepted there. But were there other reasons for this authority? It is hard to see, and if the project manager's boss tried to stop Caesar, could one of the other project members take over the manager role, and just escape the threat?

Caesar was also part of the Statoil organization, and this was probably of the greatest importance to their interactions with groups and persons outside Statoil. But as I studied the core team only, I will not go into this type of nesting.

Coupling on the other hand, the looser or tighter connections between the actions of the individuals in the group, and the connections between actions of the group and other groups, is a fruitful view. Taking the connections between groups first, I shortly commented on Caesar's competition with other projects. (on page 79) This coupling was dangerous and caused an attempt to stop the Caesar project<sup>7</sup>. This force outside the group should not be overlooked when studying real life groups.

Coupling also existed between the members in Caesar core team, and I have earlier just called it 'boundaries'. The concept of coupling can be used to study these connections in more detail. [Olson and Teasley, 1996] use the same word when discussing adapting cooperation and communication tools for an engineering team. They characterize the work to be supported in three degrees of coupling: loose, moderately, and tightly coupled work. This can be a useful concept for designing dispersed work support, but not as the only concept used. It is interesting to see that used the way Olson and Teasley use it, coupling becomes another approach to the task-medium fit, which I will cover later on in this chapter.

### 7.5.2 The group functions

The three different group functions are all at work at the same time in a group: the production function, the group well-being function, and the member support function. These functions are interesting either in a detailed conversation analysis or in connection with group development. Let me relate the functions to my field

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<sup>7</sup>This also caused me to become a party and not only an observer, by being forced to report on my observations. As mentioned, it also caused me to stop the observations.

study. The production function is found in the execution-performance category (EX-PE) of the email, in the goal-related conversations, in the minutes of meeting of the core team meetings, and so on. Often this function is measured in terms of success, effectiveness, productivity, or other similar terms.

The group's well-being function is concerned about the processes going on in order to maintain and develop the group characteristics which cause the group to function as a group and not as a collection of individuals. A "sound" group well-being function will ensure the continued work and functioning of the group on a longer term. The longer the group exists, the more important this function is.

Sometimes a group's success is also measured according to the group well-being function, and not only by the production function. One of the core team members touches this when he says: *"And if the result is good, that is, if you measure the success in the result, then the process along the way must have been fair enough."* Being conscious about the group's different functions, allow us to split the causality between the process and the result, and conclude that over a certain time period it is possible to create a product with great success, without the process being the same success. The group may be unable to continue working together.

The member support function has been very visible in the Caesar project. A couple of the members meant the relationships were the most valuable and lasting result of the project. This can be taken as an indication that some individual needs have been taken care of in the project: the need for close social bonds. This need sorts under what is called 'affection' by William C. Schutz, who identify three basic needs. The other two are inclusion and control. Other needs suggested are the need for affiliation, information, social support, respect, power, and several more.[Forsyth, 1990] The affiliation and inclusion needs should be seen in the lights of nesting. When there is perceived a collision between two different groups, the individual comes in a dilemma. The raising of the levels of the wanted needs in one group, may lower the levels in another group. The individual may have to choose, and it seems that Caesar has been the loosing part in many such conflicts.

### 7.5.3 The four phases

The TIP theory focuses on group development, and the four different phases of development are: inception, problem solving, conflict resolution, and execution. The inception phase is concerned with the initiation of a project and the goal setting. The individual has the possibility of being included (member support function), and the group has a possibility for interaction. The next phase is problem solving. In this phase you have technical problem solving, the individual gets

a position and status, and the group's different roles are allocated. In the conflict resolution phase, a policy is worked out, the individual gets its payoff, and the group's power distribution is established. The last phase is the execution phase where the group is performing or working on goal attainment, the individuals have the possibility of participation, and the group well-being function is characterized by interaction.

In the Caesar project these phases were mingled, that is, the group had a lot of circular movements between the different phases. The prescribed paths through the phases described in the introductory theory chapter are not so fixed as it may seem. I let McGrath explain:

*"The course of a project through these stages is not always as clear cut as indicated thus far. At the outset a group may not recognize that a project requires technical choices or resolution of conflicts, or both. Such groups may persist in trying to execute the project directly, without making those technical choices or resolving those conflicts. If so, the project will flounder in execution, eventually getting cycled back to appropriate earlier stages. Moreover, it is not always clear whether the problems or the conflicts have to be resolved first. Finally, actually working through the project may create new technical problems, or new conflicts, that were not there at the outset, and hence may require group action on the project to cycle back from the execution stage to some earlier stage."* [McGrath, 1990, p. 33]

When I arrived in the project, it seemed that they were about to start the execution phase, but at the same time a whole lot of new group members were included for the production of the prototype. This way the group was extended to not only include the core team members, but also these new "workers." They needed to go through the appropriate group phases too. Here we really see how the core team and the production team are nested. The production team was a part of the Caesar project, while the core team was also a part of the production team. This production team never became a team, although the RPP I included team building activities. The result was that several smaller teams did separate tasks and some single consultants worked alone on specific tasks. But they needed to coordinate their work to some degree. This coordination was mostly tried to be done between the core team members.

I guess the core team had been through the different phases, but as I also have commented on earlier, it seemed to be that the goals were not clearly set, and that the core team did not have a common vision about the goals. They had conflicts early, one was when choosing web technology as the basis for the product, but new conflicts occurred and the goals changed. This caused a repeated return to the earlier phases.

I believe that the following would have helped Caesar a lot:

- a focus on which phase the project was in,
- a focus on what had to be finished before going on, and
- a consciousness about when the project needed to go back to an earlier stage (to solve conflicts, change the premises for the work, or make new goal choices).

I do not think the goals should have been fully determined at the onset of the project, but rather that the project should have consciously established new goals when they became apparent. It seemed that a lot of effort was made in order to fit the new directions of the project within the same goals.

#### 7.5.4 Organizational perspective

Finally, I will see my field study in TIP theory's organizational perspective. I can say little about the construction processes, as I was not observing the project at that stage. The operations processes are actually the TIP theory with its functions and phases, and I have discussed these above. The reconstruction processes concern the "modifications of people, tools and purposes as a result of having done the project." (citation from the theory chapter) This has been called 'experience transference' in Statoil, and is extremely important in the large development projects (both offshore and onshore). In the Caesar project they finished phase I, 'the pilot phase', soon after I finished my observations. The resulting product was satisfying to the customers, and they decided to fund further work and the creation of a more complete product. This means that the core team carried on, but now a few members disappeared and several more were introduced. The core team became even larger.

They had a two-days seminar for 'experience transference', using an external consultant as a chair. I was not present, but I got the following remarks from some of the participants: "*unnecessary*", "*just scratching the surface*", "*just when it started to get interesting, it [the issue] was called off*", "*nobody was actually willing to reveal themselves.*" I did not hear anyone say that the seminar was useful. I will not comment this without having more specific empirical data, except that it seems that the reconstruction processes were not too well attended.

The last processes in the organizational perspective of TIP are the external relations processes. These are the group's handling of the monitoring and management of its relations to the context, both within and outside the Statoil organization. They all had responsibility for the external relations within their own responsibility area. This was handled as if they were working alone. When it comes to the internal relations, the project manager spent a lot of time monitoring,

gaining support, "fending off attacks", and so on. And the way they were organized, it was evident that one of the important tasks for the project manager was just that.

In addition to this, one of the team member's defined himself as "gatekeeper" for the project. He had found this word in an article he had read. According to him, the gatekeeper role was to bring in external sources and people as inspiration for new thoughts and for a better product. He took this role very seriously, and a lot of his inputs influenced the product. But of course, most of the contributions came from his contact network and within his responsibility area only.

It seems that TIP theory can be a useful tool for the analysis of a case study such as mine, and not only for what it normally is used for: detailed analysis of group work. (like in the JEMCO studies: [JEMCO, 1993] and [JEMCO, 1996]) I have here seen just some of the findings which most obviously are useful to see from a TIP theory perspective. I could of course tried to fit all the findings into this theory, but I do not find it useful nor appropriate. I will get back to this in the last section of the next chapter: Putting theories in the right places (starting on page 140).

## **7.6 Task-Medium fit: a re-visit (fitness, are you there?)**

The notion of information richness is used to organize different media on a scale from low to high. Information richness is the ability of a medium to carry information of varying sort. The thought is that media with high information richness carry "surplus" information needed to reduce the equivocality of a message.

[McGrath and Hollingshead, 1994, pp. 108-112] are using the task typology of TIP theory, and relate the four of the tasks to media measured according to information richness. I have once again included the figure as a reference (table 7.1). The four tasks are generating, intellective or problem solving, judgment or decision, and negotiation tasks. I argued in the theory chapter about task-medium fit that this model might help in the understanding of the factors of sustained communication, even though it originally was intended to be used for group support systems. Let us take a look at the findings:

The planning tasks were well represented among the email messages (GE-PL), but the creativity task was not. According to the figure, computer systems should be a good fit for generating tasks. We see that they do not differ between the generating-creativity task and the generate-planning task, but include both within 'generating tasks'. And the class of 'computer systems' can include many things, and there is not only one way to create a group support system.

What about making decisions? The respondents said in the interviews that

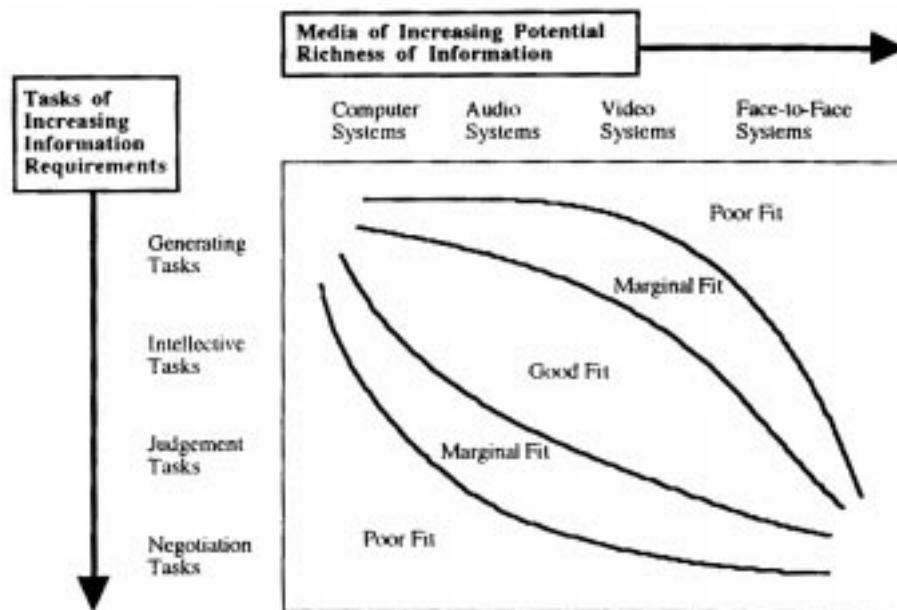


Figure 7.1: The task-medium fit.

they could use the telephone for quick and simple decisions, while more complex decisions had to be handled face to face. This first claim seems to fit with the model, there is a marginal fit between judgment tasks and audio systems. But the model suggests that a video system should be sufficient, and the respondents said video conferencing could only be used for follow-up meetings. And we see that the EX-PE category, execution performance, can not be fitted in anywhere in the model.

Alas, it does not seem that the task-medium fit model can give us much additional information, and it might be too simple to be correct. Though the idea that there should be a fit between the task you have to do and the tools or media you use, is still appealing. What shall we do? Shall we extend the model? Or build another one? As earlier noted, [McGrath and Hollingshead, 1994, pp. 108-112] use the task-medium fit when looking at group support systems (normally brainstorming and decision support), but they write in the discussion of the task typology:

*”Furthermore, because different kinds of technological systems have impact on different parts of group process, according to TIP theory, they should have different patterns of effects (both positive and negative) depending on what task(s) the group is doing. Hence TIP theory emphasizes the likelihood that system performance will be*

*a joint function of a number of features (of group, task, situation) in interaction with a given form of technology.” (p. 70)*

But they do not present a more general model similar to the task-medium fit. We then need to search for help other places.

Following the references to Daft & Lengel in [McGrath and Hollingshead, 1994, pp. 108-112] we find that the concept of information richness was originally constructed in a theory explaining why and how organizations process information. Shortly told, they suggest that there should be a fit between the media richness of the mechanisms structuring and interpreting the information (like rules, planning and group meetings), and the requirements for information processing (determined by the lack of, and the ambiguity of the information). As an example, there is no need to have a meeting to discuss the change in the oil prices if all the consequences are known and indisputable. A short note being circulated will be enough. [Daft and Lengel, 1986]

This is certainly related to the problem of choosing communication medium for a message, but is it a useful approach? My findings indicate that using only the characteristics of the information will be to ignore a lot of important factors. Then, we have come no way by turning to the origin of 'information richness'. But, it turns out that Daft & colleagues have used the concept in studies of managers' media choice where the individual's media decisions are explained. This may seem a more propitious path for the understanding of the relations between communication tools or media and task, intentions, and context. After all, the task-medium fit seems only to be a description of **one** thing you should consider when making a media choice. In the next chapter I will follow the track of media choice.

# Chapter 8

## Theory Discussion

*In this theory chapter I will review and discuss the theory on media choice. I end up suggesting that a fruitful complementary view of the use of sustained communication is to see it as a communication skill. In the second section I argue for this, and show how this choice gives us access to a lot of useful concepts and techniques. This thesis has reported on a study of communication patterns in a real-life setting. This means that I also have been studying the rich context the patterns exist in. There is a vast amount of theories to choose from, and I claim that most of them have something to contribute. But then we have to understand the relations between them, and we must painstakingly pronounce our perspective at any given time. I present a framework for this in the section called 'Putting theories in the right places'.*

### **8.1 Task-medium fit or choosing media: extending the theoretical position**

At the end of the last chapter I argued that the 'task-medium fit' concept was not theoretically strong enough to give us the understanding of sustained communication we want. But what do we need? We need a theory taking into account the richness and complexity of sustained communication; this includes the individual with her experience in task, technology, and communication, her beliefs and theories, social style and preferences. And for the context: the factors of the actual situation, the social rules and culture both on the group and organizational level, and the nature of the communication tools available. This seems like "explaining the world," but complicated it is, and we must not be afraid of complexity and the possibility of having a theory with loose ends.



### 8.1.1 Social presence theory

Short, Williams, and Christie were probably the first out with a modern theory of media choice. Already in 1976 they suggested the social presence theory. [Short et al., 1976] The model uses a single scale to characterize the social awareness of a communication medium. That is, the person's presence is higher in face to face communication than in a letter. The efficiency of the communication or the appropriateness of the choice is determined by the match between the medium's presence and the interpersonal involvement required for the task. Or, tasks requiring high interpersonal involvement, like negotiation, should be carried out using a high social presence medium, like face to face. It is interesting to see that according to this thinking, TIP theory tasks also have interpersonal involvement requirements. This fits well with the TIP theory, and seen from this perspective the task-medium fit model actually becomes a different way of viewing the same thing as in the social presence model. They have of course both the same shortcomings.

### 8.1.2 Symbolic interactionist perspective

We then get back to Daft and colleagues who have a symbolic interactionist perspective. Symbolic interaction is a sociological theory where society is seen as interaction and the development and the use of a shared system of meaning consisting of symbols. They relate this perspective to media choice by stating that media choice is influenced by the following three variables: the equivocality or ambiguity of the message, contextual determinants, and the symbolic meaning of the medium itself. [Trevino et al., 1990]

They classify, as they did before, the media according to media richness, and define richness in a more concrete way. Media richness is based upon: 1) the promptness of the turn-taking or what they call "availability of instant feedback." 2) the medium's capacity of carrying multiple cues (non-verbal, backchannel information). 3) the use of natural language and 4) the personal focus of the medium. They here mean the accessibility to feelings and emotions.

They conclude that effective communication is reached by matching the message's equivocality with the appropriate richness of the medium. This choice of media is influenced by, and the effectiveness can be changed by the other two factors: contextual determinants and symbolic meanings of the media. They claim that the understanding of the choice process and the different connected variables is a help for choosing media efficiently, and they present a study of manager's media choice and show a relation between rational media choice and performance ratings. They also find a relation between the equivocality of a message and the use of rich media.

### 8.1.3 Social influence model

According to Fulk et al., both social presence theory and the symbolic interactionist perspective are rational choice models. Basically, the idea behind is that by assessing the requirements of the task and the characteristics of media, it is possible to find a match and thereby communicate efficiently. In the symbolic interactionist perspective contextual and symbolic factors are also considered. But there still is a rational choice, and all other choices are not optimal. These theories do not take into account individual preferences, hidden goals, and so on. Fulk et al. list several assumptions of this rational choice approach, and empirical findings which cannot be explained. [Fulk et al., 1990]

Instead they present another approach called the social influence model. The social influence model is also based on symbolic interactionism, but in addition attribution theory, cognitive dissonance theory, learning theory, and social information processing theory. Their main contribution is a strong focus on the social construction of media and task evaluations. Their model can be seen in figure 8.1.

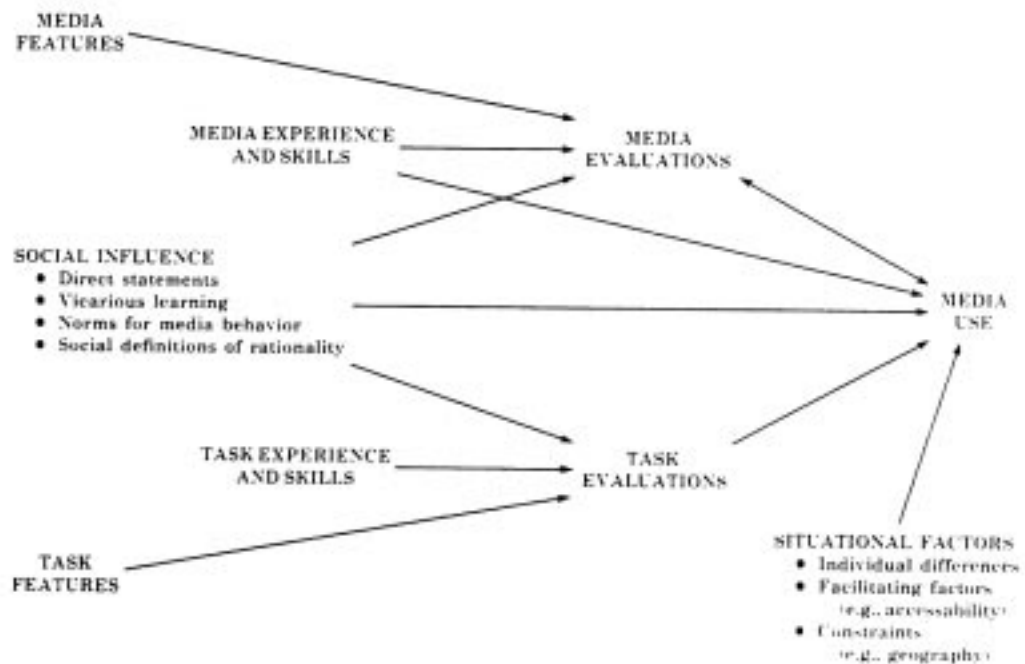


Figure 8.1: The social influence model.

Let us start with the media use or choice. The factors directly influencing the final use are the following: media evaluations, media experience and skills,

social influence, task evaluations, and situational factors. The evaluations are also influenced by social factors and by experience and skills. The evaluations are also influenced by the media and task features. And Fulk et al. point out that these are not constant, but variable and socially constructed. Another important thing is that the choice is now seen as subjectively rational and not objectively rational. This means that the individual's goals and hidden thoughts may well influence the media use in a way that may seem objectively irrational, but subjectively seen it might be completely rational.

[Fulk et al., 1990, p. 126] write:

*"A host of factors beyond those described above [in the model] come into play in any organizational context. A detailed treatment of these factors necessarily would complicate the social influence model to the point where it becomes the proverbial "Indian war," with causal arrows flying in every direction. Then, the model would lose its unique value as a guide for highlighting the social influence process as applied to media use. For purposes of simplicity, we simply label these other contextual features situational factors."*

It is clear that the 'social influence' label also contains a lot of factors and complicated relationships. Let us return to the Caesar project. Is this model useful for the understanding of what was going on there? The social environment of their departments, the Statoil organization, and the project group itself seem all to be included. The situational factors are included, as well as the individual's experience and skills, and of course the media and task features. And with a subjective rationality, it seems that all the factors from the findings are present.

I find this model to be useful in order to understand the media choice and the factors underlying media use. Hence, also the understanding of the variables influencing sustained communication. But I have a few remarks. First of all, you cannot find the subjective rationality anywhere. Where should hidden goals, revenge, desires, emotions, the manipulation, and so on be placed in the model? Second, where is the cognitive processing and the decision really taken? It seems that the decision and the action is the same thing. But, on the other hand, evaluation is done both in 'media evaluations' and 'task evaluations'. Are these the only evaluations? Seen as a whole, the model seems too much as a black box: a lot of variables go in, and out pops the answer. And the prediction value of the model is not very high.

Third, situational factors like time and space constraints are put together with situational factors like the annoyance over the last telephone and the pain from your blisters after your last hike. The first two will probably be considered consciously, but the second two might have an unconscious influence. Fourth, the

social influence is one black box, and with my case study in mind, I would have found it useful to divide the social influence into factors relating to the peer group and to the organization as a whole. In order to use this model in the real life, you have to be able to identify where any change should be applied to change media use. This distinction would have been a help.

Fifth, and maybe most important, the receiver of the message seems to be completely forgotten. The three threads in my case suggest that the receiver is extremely important to the communication and the choices made.

When it comes to the use of the model, it is descriptive, but its explanatory and prediction powers seems less obviously. But I agree, we here have a catch, because it is the complexity which causes this, and complexity was something we wanted. Also, the model is not normative. You cannot read out of the model how to efficiently choose media. This was possible with the task-medium fit and the other two models of media choice. Still, we have already concluded that these were not satisfactory. When I introduced the task-medium fit, it was as a tool for understanding. If we leave it with that, we can start out with the social influence model and improve it as I suggested above. But, the usefulness of the model in the real life will not increase. I therefore suggest a complementary way of looking at the use of sustained communication and media choice: as a communication skill.

## 8.2 'Choosing media' seen as a communication skill

*"Any analysis of interpersonal communication is inevitably fraught with difficulties, since the process involves a large number of interrelated factors. This means that in order to make sense of, and systematically investigate, social encounters, it is necessary to employ an interpretive framework with which to study this area."*

With these words Owen Hargie opens the introductory chapter in a book with collected chapters on communication skills. [Hargie, 1997a, p. 7] His answer to the difficulties is the interpersonal communication model found in figure 8.2. [Hargie, 1997b] There are of course a lot of different models of communication. A look in the Encyclopedia Britannica will give you several. [Britannica, Web] Why then choose Hargie's? His stance is that communication can be seen as a social skill. This way he can use the research and conceptual contributions from the research of social skills. Especially in the field of pedagogy this approach has received much attention, because, as you will see, the learning aspects become particularly clear compared to the traditional communication process approach.<sup>1</sup>

<sup>1</sup>This section is based upon the following two sources if not otherwise stated: [Hargie, 1997a] and [Hargie, 1997b].

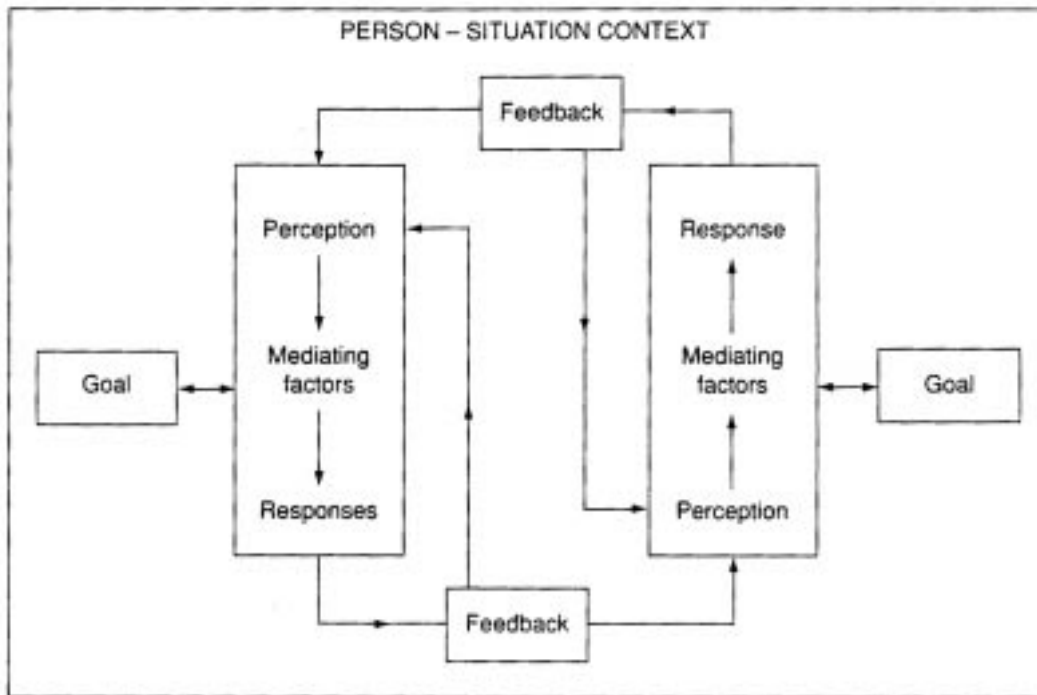


Figure 8.2: Hargie's model of interpersonal communication.

### Social skills

He uses motor skills as the point of departure when exploring social skills, and after reviewing a collection of definitions of social skill, he adopts the position that *"social skill is the process whereby the individual implements a set of goal-directed, interrelated, situationally appropriate social behaviours which are learned and controlled."*

With this definition he emphasizes the following six elements of social skills, namely that they: *"1) are learned; 2) are composed of specific verbal and non-verbal behaviours; 3) entail appropriate initiations and responses; 4) maximise available rewards from others; 5) require appropriate timing and control of specific behaviours; and 6) are influenced by prevailing contextual factors."* [Hargie, 1997a, p. 12] After analysing these elements and relating them to motor skills, he identifies four key differences between them: 1) social skills always involve other people; 2) feelings and emotions are important; 3) the perception process is more complicated (our own responses, the responses of others, and perception of how others perceive us or meta-perception); and 4) personal factors like gender, age, and appearance influence the interaction.

### The model

After this quick glance at social skills, we go back to the interpersonal communication model which I will use to explain the different aspects. (figure 8.2) The two large rectangles represent the two individuals involved in the encounter. They have both their own goals and a perception of the world outside. The interaction is a continuous process where the feedback information (verbal, non-verbal, and backchannel communication) is perceived by the other, and a response is delivered after the cognitive processing of the feedback information, the person-situation context, related with the goals, and affected by the mediating factors.

The mediating factors consist of the cognitions (thoughts, mental processes) and emotions. Hargie write: *"The term 'mediating factors' refers to those internal states, activities or processes within the individual, which mediate between the feedback which is perceived, the goal which is being pursued and the responses that are made."* [Hargie, 1997b, p. 35]

In the person-situation context the person factors include age, gender, personality, and appearance. When it comes to the situation factors, it is important to understand that the situational factors are not purely contextual, but is rather an interaction between person and context. The person in the situation is always bringing with her past experiences, skills, beliefs, biological characteristics, and more. This position is related to Berger & Luckmanns' social construction of reality [Berger and Luckmann, 1984]. These are the situation factors: goal structure (a set of situation specific goals necessary for reaching the main goal), roles, rules, repertoire of elements (the range of known and possible behaviours), concepts, skills, language and speech, physical environment, and culture.

### Back to the social influence model

Let us compare this model to the social influence model of Fulk et al. on page 132. In Hargie's model the decision process and the goals are visible, while the experiences and skills of the social influence model are found in the "person-situation context." A shift of focus with other words. The objective media and task features have not a place in Hargie's model, but the media and task evaluations or cognitions are there and can be found among the 'mediating factors'. The social influences and the situational factors of the social influence model can all be found in the 'situation' part of the 'person-situation context'. And finally, the media use is a part of the 'response' in Hargie's model.

It seems that the social influence model is a more specific model then the interpersonal communication model, which is hardly a surprise when we look at the targets of the models. We loose the focus on medium and task, but what do we gain in the understanding of sustained communication?

### The gains

Like the social influence model, the interpersonal communication model rests upon a lot of theories, but it is a **framework** for the understanding of interpersonal communication, not a self-contained model. This way it can be used as a frame around several other theories, and it can be a help for the connection of these. The social influence model is only open to this in the 'social influence' and 'situational factors' boxes, but it is not intended to be used as a framework.

We also gain a full-fledged understanding of social skills and communication. Using this understanding we will be able to investigate factors not even touched in the media choice theories. I will come back to this below. But first I will take a look at the definition of social skill and the six emphasized items described in the beginning of this section.

First of all, the behaviour related to social skills is **goal-directed**. The behaviour is not random, but is purposeful seen in the lights of the goals of an individual. This subjective rationality is shared with social influence model, but it is here more visible. The behaviour is also **interrelated**. This means the individual is not alone in the world with her decision like it may seem in the social influence model (though ironically focusing on social influence), but the behaviour is intertangled with the behaviours of the other, as described in the feedback, perception, mediating factors, and responses loop.

Furthermore, social skills are **learned**. This may seem like a trifle, but the social influence model did only encompass the possibility of learning about task and media, in the 'task and media experience and skills' boxes, not the learning of how to choose which is tangled with social skills of various kind.

Social skills are **composed of verbal and non-verbal behaviour**. Social influence model do only focus on the media choice itself, and not on the complex behaviour the choice will be observed in. By seeing the whole picture, we will be able to more correctly interpret, and to understand media choice in a broader perspective.

Entailing **appropriate initiations and responses** and is **situationally appropriate**; a social skill view opens for the possibility of saying that some behaviours are more skilled than others. It does not say what is skilled and what is not, this must be judged from the complete picture of the situation, individual, and interaction partner. But the social skill view is not entirely descriptive. To be socially skilled also implies that the rewards from others are **maximised**. This is another criteria for determining whether the behaviour is skilled or not. Again, descriptions of what is maximising behaviour, is left out. As with appropriate initiations and responses, maximising rewards must be seen related to the goals, the feedback received, and the mediating processes.

Social skills also include a requirement for **appropriate timing and control**.

This stress the purposefulness of the behaviour, and the importance of not only giving the appropriate response, but at the correct time as well (answering an angry email at once while the anger is high may not be skilled if your goal was to avoid a conflict, but would have been the appropriate time if that was what you wanted)

At last, we have that social skills are influenced by **prevailing contextual factors**. This is in common with the social influence model where it is called situational factors.

### **Elements**

By using the concepts above and Hargie's model of interpersonal communication a lot of factors can be investigated. As I only intend to suggest and show the possibilities of this approach, I will not cover all the connection between sustained communication and social skills. This would have demanded a more thoroughly discussion than appropriate here. But I will bring forward a few interesting elements of the social skills approach.

First of all, it seems to fit better with my findings. It is easier to include the importance of the relationship between the two persons interacting, politicking and manipulation can also be analysed, and the idea of scripts can be included in the framework (see below). The capturing of the complexity I argued for, is also done using social skills as an analysis model. The non-verbal communication, which the core team felt was so important, can also be taken into account.

As indicated above, the timing and control aspects seemed to be a promising way of analysing the communication threads in the case. Going deeper into the control aspects, we find that nine levels of control from social learning theory are used, from the biological level up to system concept control concerned with the control of your idealised self-concepts which guide your principles on the level below, which in turn control scripts, and so on.

It is also interesting to note that when discussing 'goals', Hargie brings up the issue of uncertainty reduction, or more specific that we have a need for high predictability and our goals are motivated by this. [Hargie, 1997b, p. 33] This brings our thoughts over to the symbolic interactionist perspective which actually saw uncertainty reduction as one of three influences on media choice.

I have also discussed the meta-communication level of the core team, and related this to manipulation, politicking, conflicts, and conflict awareness. Hargie discusses meta-cognition, which is the forming of cognitive conceptions of others' cognitive conceptions. (p. 37) This seems to be a very interesting approach to these issues.

Non-verbal and backchannel communication have also been mentioned several times. These concepts derive from the communication research, and have



been analysed in the form of feedback, which can be found in the model.

The fundamental attribution error, which I suggested as an explanation for the misunderstanding in the workflow modelling thread, is a cognitive element, and is organized in the model in the 'mediating factors'.

Finally, I will like to say a few words about learning, as I promised. The 'learned' aspects of social skills, and the notion that there exist a way to judge whether a response is skilled or how skilled it is, open up for the possibility of creating systems for the training of the skills. In [Hargie, 1997c], Hargie discusses such a system called CST, or communication skills training, which was first introduced at Stanford University, California, in 1963 under the name of 'microtraining'. I will not go into the details of this training system, the important thing here is that by seeing sustained communication and media choice as socially skilled performance it is possible to make use of training systems like CST.

When all this is said, I will make a few comments on the difference between core communication skills and specialised contexts. The core skills can be self-disclosure, listening, and questioning, while the specialised contexts are more compound, like negotiation, bargaining, and confronting. Media choice is actually incorporated into Hargie's definition of social skills. Giving appropriate responses, maximising reward, and appropriate timing and control suggest that to choose the correct media is actually a part of being socially skilled. Saying that media choice can be seen as a social skill becomes a tautology<sup>2</sup>! Without going deeper into the matter, I will introduce the idea that media choice maybe can be handled as a core communication skill in the future, and that sustained communication can be seen as a specialised context.

### Drawbacks

I have argued that the social skill approach's best quality is the ability we get to incorporate all the findings of the field study into the model, and that relations can be seen. But that is also its problem. It might be that the framework gets too comprehensive and the overview can be lost. But I argue for an eclectic approach, and see the models as representatives of different points of view, which can give us complementary insights. This is the topic of the next section.

It can also be argued that the medium or the communication tools now have completely left the picture. The objective features of task and medium have disappeared, but on the other hand, the "social construction" perspective fits better with my epistemological stance. (chapter 2.1)

It can also be said that the person-situation context mix things together, and that group, social context, organizational context, and culture could have been

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<sup>2</sup>A tautology is a "needless repetition of an idea in different words." [House, 1992]

organized in layers. Personally, I would have preferred such a solution, but I do not find it crucial for the model as such.

An extension to the model can also be suggested: in sustained communication something sustains communication. This something can be put between feedback and perception, for example in a box with the name 'communication tool' or 'medium'. Actually quite similar to some traditions within communication theory which use 'transmitting medium' and 'noise' in the analysis.

### 8.3 Putting theories in the right places

In this report I have handled a lot of things. I set out to study the communication patterns of a team in a real life setting, and was particularly interested in the rich context the communication pattern existed in. The result was that I had to relate to a lot of different research areas and theories, and I found that they were all mixed together, and it was not always easy to see how they were connected. During the writing of this report, I have tried to keep things apart, and to state at which level of analysis I dwelled in, or the point of view I had. I differed between the individual, the interaction, the core team or the project, and the organization. If you take a look at the table of contents, you see the signs of this division.

I have showed that different theories can contribute with different perspectives and insights, and I argue for an eclectic approach to the use of theories. You should state what you are concentrating on, and the level of analysis, and then choose or develop theories from this point of departure. Too often theories developed on one level or from one perspective are used under other circumstances than they were meant for. Sometimes successfully, but mostly not. There also seems to be a tendency towards "theory monogamy," the use of one model or theory to explain everything, or at least acting like the things that falls outside the model are not interesting.

Here, I argue for "theory polygamy", the use of many models in order to view the research from different angles. This is similar to Morgan's metaphor approach to organizational understanding. [Morgan, 1997] In table 8.1 you will find an overview of the perspectives related to the work in this thesis.

As you see, there are six different levels of analysis. On each level of analysis you can take a certain perspective. It can be a model or a theory, or a way of viewing the phenomena in interest. On each level there is a collection of perspectives which have been used. These perspectives will normally focus on something more specific and leave other things out, of course in varying degree. For example, within group dynamics there is a vast field of research, theories, and models. The models and theories listed are just examples and are included either because they have been mentioned or are closely related to my work.

Sustained communication seen as:	Focus	Model/theory
part of a social context	social factors, society, and culture	social learning theories social construction social information processing symbolic interaction transactionalism actor-network theory
part of an organization	organizational culture and change	socio-technical approach business process reengineering organizational learning total quality management organizational metaphors
teamwork	group dynamics	TIP theory adaptive structuration theory
interpersonal communication	interaction	Rommetveit McGrath Hargie Richards McLuhan
social skill	individuals in interaction and development of skills	Hargie
media choice	individual decisions	social presence theory symbolic interaction social presence theory

Table 8.1: Table of theory polygamy

Using the table above to explain the work in this report, we can say that interpersonal communication (the communication patterns) were studied as a part of an organization and as a part of a teamwork. The exploration of the findings led me to the problem of understanding media choice, and after gaining some understanding and identifying areas the models could not explain or incorporate, I went one step up the ladder and suggested to also use the perspective of social skills.

Using this approach to identify the substantive and conceptual domain you are within, can help both the researcher and the readers when relating research from different areas to each other.

This table can also be seen as a guide to the methodological domain. For each step you take up the ladder, you must "zoom out" your binoculars. When studying teamwork, the group is the subject of study, while if you study media choice, the

individual is your primary target. The time necessary for a study is also normally increasing as you step up the ladder. You can make an interview of two hours with an individual and you will gain some understanding of her media choices, but two hours of observation in a large organization will not give you the needed information.

Used together with McGrath and Hollingsheads' research framework presented in the beginning of this report, the theory polygamy approach provides a powerful means for navigation in this complex area.

# Chapter 9

## Wrapping Up

*In this last chapter called 'Wrapping Up', I will summarize the main issues of this thesis and the main findings. I will take a look at the consequences of the findings seen from a practical point of view, or said another way: suggestions for acting upon the findings. Finally, as this study has been exploratory, it is important to identify areas of interest for further research. I will present these in the last section.*

### 9.1 Summary

#### 9.1.1 Overview

Seeing the Caesar project and its members from a distance, three things are particularly visible: First of all, the complexity is overwhelming. I set out with a conviction that the area *was* complex, but I must admit that I thought single phenomena could be studied in more isolation than it turned out. The organization, the project, and the members were so intertwined, and at the same time the individuals seemed to handle this spider web with a matter of course. They were even pretty conscious about maneuvering in this landscape. And this was the second visible thing. The consciousness of the Caesar team members makes the communication look like a game where you must make the right moves in order to win the situation, the case, or the decision.

Third, I showed that this complexity is possible to conquer, but that you have to balance skillfully when doing research, both when it comes to methodology and the handling of theory: match the methodology and research design with the research project, do not become an offer for 'methodolatory', be conscious and explicit about your choices, and be a theory polygamist. As I argued in the introduction to the research fundamentals chapter, this is extremely important

when doing research in a cross-disciplinary field.

In a cross-disciplinary field of science it is not possible to force everyone to use one single research tradition, and matching the methodology with the research project as I argue, will inevitably result in the usage of several research traditions and strategies. Both will give you problems when comparing findings and summarizing research. The answer is the prescription I have given above, but with one addition: A common research framework is needed in order to be able to compare and summarize. This framework must be explicitly used by all research projects in the area.<sup>1</sup> I have suggested the use of McGrath and Hollingsheads' framework as described in chapter 4.4. The detailing of the relevant variables can be found in appendix C.

### 9.1.2 In more detail

It is not easy to summarize an exploratory case study of such complexity. It is the relations, the complex patterns which inspire and inform. But, the communication patterns were the primary focus, and I wanted to see the rich context they existed in. Hence, I chose methods accordingly using an eclectic approach. I argued for this in interaction with the definition of my three research domains: the substantial, the conceptual, and the methodological domain, and my epistemological stance.

I presented two research frameworks, one I made myself for the initial stages, and one found in my substantial domain for the more detailed design, observations, and analysis. Important parts of my substantial domain were presented in order to reveal my predispositions and to establish a theoretical framework for the analysis of the case. Task, interaction, and performance (TIP) theory was presented, together with the idea of task-medium fit and a discussion of concepts.

I will use my research questions to organize the rest of the summary.

#### **How does the dispersed team organize its work and internal communication?**

Caesar divided their work into separate pieces and mostly just coordinated the pieces. I showed how the Statoil organizational context, with an internal market and no rules for projects, influenced the project's life and how they were organized. This was evident in the discussion on the official (user-controlled and teamwork) and the backstage (self-controlled / organization controlled and separate projects) views of the team organization. The communication in the core team was primarily supported by phone, email, formal meetings, and informal

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<sup>1</sup>I do not really expect this to be possible, unfortunately. But this is the picture I mean describes the ideal situation.

meetings as a result of personal relationships. The use of an electronic document database failed because it was bad designed, it was never clear how it was to be used, and most of the members had never used it.

### **How do the members experience working in a dispersed team?**

The respondents in the interviews were very satisfied with the personal relationships they had the opportunity to establish. They also felt they had learned something, and that the interaction often was professionally rewarding. But there was no general cohesiveness in the team, and it got no further than single relationships. The nesting of roles and the hidden agendas were efficiently stopping a more cohesive team. They also felt that the team needed the personal contact, but also that it had not been possible to get the same results if the team was collocated. They seemed satisfied with email, telephone, and the face to face contact they had. Other tools were also tried, but they did not find them satisfying.

### **When asked, how do the members reason about media and tool choices?**

They agreed that email could be used for quick and short messages, that the telephone was for short messages and discussion over topics, but not decisions. And they all emphasized the importance of personal relationships and the non-verbal communication of face to face contact. On the project planning task the respondents confirmed this focus on trust and relations. Also a matter of course, was that the tight collaboration had to be done sitting together.

Only one person meant that email could be used for simple decisions, and one that email was useful for long messages with documents and for substantiated messages. One person also tried to avoid the telephone when possible, and only use email or face to face communication. They also disagreed to how conflict should be handled, one person said he handled it the way that gave the best payoffs for him.

They seemed all unexpectedly conscious about their choices when communicating, and one person seemed to tactically consider every communication choice he made.

### **What are the observed communication patterns and the use of communication tools in the group?**

The observation confirmed the importance of trust, relationship, and face to face communication. The individuals seemed influenced by, not only their thoughts and experiences with the task and the medium, but also by the interaction partner, their common history, and the current relationship they had. Their real use of

the communication tools and their choices did not always fit with what they said they did. It seemed that the initiation of a communication thread was the most conscious act, while in subsequent communication the level of consciousness was not very high.

The level of consciousness on conflicts and the use of explicit talk about the communication (meta-communication) were both low. This was in contrast to the consciousness about communication choices, and indications of manipulation, for example by copying and blind-copying managers and others in email messages in a conflict. I also found several occasions of what I called "silent conversations and decisions", occasions where two or more people had the opportunity to communicate without other people knowing.

### **Theory**

I looked closer at theories about media choice in order to find a theoretical framework to connect my findings. What was offered in the literature, was useful in order to understand the underlying factors, but were not appropriate to incorporate all the findings. I suggested that media choice can be seen as a communication skill, and that sustained communication lays upon the mastering of communication skills. I also put forward the opinion that it is not possible to incorporate the complexity of real life organizations into one single theory, and that this is not desirable. Rather several perspectives should be taken and theories and models should be chosen according to the current perspective.

## **9.2 Consequences of findings**

I have concluded that it is not possible to generalize the findings of this case study. The possibilities of using my findings lay in the ability of others to find similar groups and situations and, with sensitivity and skill, be able to adapt the findings to these. And, of course, my findings can be an inspiration and a guide for further research in the area. I will therefore in this section present a collection of advises or suggestions for developing the sustained communication and organization of the Caesar project in Statoil, and in the next section I will present suggestions for further research.

### **9.2.1 The organization and the culture**

Let us start with the basic conditions for project work in Statoil. The organizational structure and the internal market are there for a reason, I do not think it has become that way by chance. Still, the way a person's different roles are managed



should be a focus. Who you represent at what time, is completely up to you. An increased awareness of this can be a benefit. The way the personnel responsibility is handled should also be considered in projects like Caesar.

The organizational culture in Statoil has been difficult to describe. The organization is large, and maybe it would have been better to view Statoil as several companies. But, you will then lose the commonalities that **can** be found, and which I have tried to capture in my descriptions of the organization. The competitiveness and the networking nature of the organization are clearly influencing how a project like Caesar is organized. These features are likely not to be only for the bad, but they open up for a whole range of possibilities for manipulation and politicking, as we have seen in Caesar.

I think that a general awareness should be increased on the following areas: the issue of communication choice, alternatives to travelling (positive and negative aspects included), the power of information, manipulation possibilities, meta-communication, and conflict management. The risk is of course that this can lead to more competitive and manipulating behaviour, but hopefully an awareness of the issues can help people discover how and when such things happen, and thereby decreasing the advantage of those who act manipulative.

A training program can be used to increase the awareness, where the content naturally could be selected from TIP theory, theory on communication skills (including media choice), meta-communication, the nature of conflicts, and how to constructively solve them. Of course, instead or in addition to this, other means can be used: corporate documents, corporate bulletins, applications, and so on should include the awareness. But that is an issue for the field of persuasive communication.

### 9.2.2 Support for project communication

This will not be enough. Training outside the work context has limited effect. By using the four processes of groups in organization known from the TIP theory, we can suggest a scheme for helping projects with the organization and communication. This help can be in the form of rules, guidelines, external facilitators, and training.

#### Construction processes

During the construction processes there is a need to design the cooperation of the project. Each project is unique, and so are its members. The goals of the project should be determined and the external conditions surveyed. Together, the team should design how they want to communicate, arrange meetings, use different communication tools, and so on. I will call this "cooperation design." It is

amazing how many project planning systems which concentrate on plans, Gantt diagrams, schedules, etc., and completely forget the cooperation and the group processes.

In this cooperation design, the nesting of the members group memberships and the groups larger group memberships should also be identified. Possible role conflicts and potential for cohesiveness in the group should be determined. Likewise, the coupling of the members' activities should be identified, and the handling of these couplings agreed upon. Procedures for conflicts related to coupling should also be discussed and written down.

Furthermore, they should agree to how future disputes and conflicts with emotional aspects should be handled. Altogether, such a "contract" if you like, created by the team together, can be a problem preventer. It is like writing a cohabitant contract as an insurance for not getting into trouble.

Eric's approach of dividing the team into groups with different functional responsibilities also seems sensible. The team can still be one single team, but in addition be split into virtual teams according to function.

### **Operation processes**

During the operation of the project the "contract" should be used extensively where it is appropriate. Here an understanding of group processes will be of help. Most project manager training schemes incorporate group process education, but also the project members should have an equal understanding. This is where the training mentioned earlier will be useful.

Rules and guidelines for "proper conduct" when it comes to communication and media choice will also be a help to the project. But it should always, within certain frames, be possible to adapt the rules to the cooperation design.

My findings also suggest that people do not think in applications like Lotus Notes, Netmeeting, and so on. They rather think in terms of tools, like email, ESOP, discussion database, application sharing, video-conferencing, etc. This again suggest that the project members should have available a collection of tools, a toolbox, for a wide variety of tasks and messages. (Similar to the approach of [Olson and Teasley, 1996]) From this toolbox they can pick and reject according to their preferences, mood, interaction partner, task, and more. As this toolbox cannot be designed for each new team, the available tools should be adaptable in order to prevent the toolbox from becoming too full, and ending up with some nice tools lying at the bottom unused.<sup>2</sup> The use of this toolbox should of course also be discussed during the start-up and the cooperation design.

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<sup>2</sup>We may imagine a web-application or something similar which can enable the user to collect the tools she is using often.

**Reconstruction processes**

The reconstruction processes connected to communication and cooperation should include first an individual, and then a group reflection on the use of communication tools, cooperation, communication, and conflict. Each should note her satisfaction with different situations, tools, handlings, and outcomes. And she should try to state the consequences for her preferences in her next project and cooperation design phase. Each should choose one or a few things she wants discuss with the group, and each individual in the group should then give feedback on their perspective of the topic. This reflection process will increase the awareness and the understanding of the interaction processes, i.e. a continuous learning process.

**External relations processes**

Here the organization should provide rules and guidelines for communication and media choice, pretty similar to the project internal guidelines and rules.

What I have presented here, is of course an ideal, and not always easy to carry out. Though, only elements of this will also have an effect. My main point here is the adaptability. Very few rules and procedures should be static, but rather be negotiated continuously and adapted to the context. What should be done "by force" is the procedures for doing the negotiating, cooperation design, and "nurturing of the group well-being function." This will obviously take a lot of time, and hence money, but it is a judgment on whether the time and money will be saved on a later stage when the cooperation, hopefully, progresses more smoothly.

**9.3 Suggestions for further research**

I will here organize the suggestions according to the table of theory polygamy: sustained communication seen as media choice, communication skill, interpersonal communication, teamwork, and as a part of the organization. All the suggestions here are of course related to sustained communication, and must not be taken to be suggestions for further research in the mainstream of these areas.

**9.3.1 Media choice**

What I write here is related to the social influence model.

The model has clearly a need for empirical support. Even though it seems to be the most extensive theory of individual media choice, there may be many variations of the models with the same variables which may give a more true

picture of the reality. I also suggested several extensions or changes to the theory in the chapter I discussed the media choice models. These suggestions will not be repeated here, but they should also be tested.

In order to be useful, the social influence model should also refine the 'social influence' and 'situational factors' categories. There are an enormous amount of possible variables influencing the media decision, and a determination of the importance of the factors will be of great value.

The model shows that media or task features join experience and skills in an evaluation that is socially influenced, but it says little about how this process goes about, which factors are included and which are the most important. This is related to the predictability critic I put forward earlier.

### 9.3.2 Communication skill

As suggested earlier, the social skill approach should be more thoroughly investigated and discussed to be sure this is fertile soil. If so, training schemes should be developed and tested to see the effects.

As suggested in the chapter on communication skill, the model can be extended to include the medium transmitting the feedback. This way the media characteristics will also be found explicitly in the model.

Of the remaining parts of the model, it is the person-situation context I feel is the weakest part. Finding the importance of the different variables, yes, even determining the variables, will be useful. Understanding exactly how the person-situation context interact with the perception, mediating factors, and the goals is also desirable.

A weighting of the variables concerned with the relationship between the interacting persons will provide more information on how media choice is adapted to the interaction partner.

As mentioned earlier, a further study into how personal relationships influence sustained communication is of great interest. Determining what happens when there are different preferences and personal uses in a communication situation, can also be well worth a study.

These suggestions also hold for the interpersonal communication level.

### 9.3.3 Interpersonal communication

A lot of research has been done in the CSCW area, and especially in the CMC area, using the interpersonal communication approach. Actually, most of the research on email communication can be found within this level. (See [McGrath and Hollingshead, 1994] for an excellent review) The design is mostly experimental and often done using

undergraduate students over a short period of time. But of course, there are some who have done more realistic studies; [Finholt et al., 1990] is an example.

It is also interesting to note how many of the studies confuse or mix up the different levels of analysis. Most often this happens when they try to use a communication perspective to explain group processes. It seems their frameworks for understanding are not complex enough to incorporate the necessary variables. By using the perspective or level of analysis approach I have argued for here, it is possible to avoid these problems.<sup>3</sup>

Except from this, the interpersonal communication approach has been very fruitful in the first stage of CSCW/CMC research. I feel the scope should be extended a bit more as we are moving from building point systems to the mapping of the dimensions of the design space. (See page 49 for that discussion)

#### 9.3.4 Teamwork

At the group level [McGrath and Hollingshead, 1994, pp. 117-125] present an excellent overview of suggestions for further research. I will therefore not delve deep into this, but only repeat their main message:

*“...future research needs to be (a) more comprehensive with respect to the variables being studied; (b) more systematic with respect to the study of those variables, and their interactions, in ways that allow comparisons of findings across multiple studies; and (c) more concerned with studying long-term and in-context effects of the use of technology in groups, rather than studying only short-run effects under context-stripped, relatively artificial operating conditions.”* (p. 118)

They also list five major themes that should be addressed: multiple criteria for assessment, variations in member and group characteristics, variations in task and technology factors, groups as multifunction systems, and impact of changes over time.

I will suggest one thing though: the revision of the task typology in order to incorporate 'socializing' as a task. It might be that McGrath sees this as something done between tasks, and not as a task, or that he has included socializing in one of the other tasks. But I have not been able to find this out. Anyway, my experiences when coding the email database suggest that the task typology should be adjusted, at least for sustained communication.

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<sup>3</sup>Note that the communication skill approach rely upon the interpersonal communication level. But this is the research found in mainstream communication research, hence the critic of the CSCW/CMC use of interpersonal communication does not affect the communication skill approach.

### 9.3.5 Organization

All the suggestions I have put forward until here, can be seen in the lights of the organization. Especially the suggestions on project organization and communication found in the 'consequences of the findings' section, will be interesting to systematically assess from an organizational perspective.

A lot of CSCW research has been the so-called adoption studies, and a lot of other perspectives as reviewed in chapter 4.1, Earlier related work.

I will suggest a focus on information and communication manipulation. Variables of interest can be effects on the organisation, preconditions, influences, development, and more. It will also be of interest to determine whether this is really widespread, or if is just something that is found in my case.

### 9.3.6 General

In addition to the argument in the beginning of the summary, I will stress three more specific points which applies to all the levels mentioned above. I find these three the most important issues to remember when doing research on sustained communication:

- the scope of the research should be broadened and become more comprehensive,
- care should be taken to encompass important variables which in earlier research have been left out or mixed up, and
- more research should be fieldwork and longitudinal in order to see the complex relationships.

The detailed set of variables organized according to McGrath and Hollingsheads' research framework is just a first draft. (Appendix C) Further work is needed to create a more systematic organization of the variables using sub-categories, and also to include more variables and to ensure that the variables listed are relevant.

All the members of the Caesar team were Norwegians. What difference would it make if the team members had different nationality? The large companies are getting larger with merging and acquisitions. More and more companies are multi-national and in their hunt for synergy effects they turn to sustained communication. Multi-national sustained communication introduces huge challenges. Research into the cultural aspects of sustained communication seems both rewarding and essential.

### 9.3.7 The Future

At the very end of this report I will take a look at some trends, and what we might expect in the future. Earlier studies of sustained communication have reported negative attitudes towards email, video-conferencing, etc. The studies of managers' media choice included a lot of managers who did not have access to email, or did not use it. [Trevino et al., 1990] Other studies have also shown negative attitudes and lack of experience and knowledge.

In my study, none was sceptical; they were open to the new forms of communication, tried and failed, but were still positive towards possible future solutions. These persons had between six and eight years of experience using computers, and they were not afraid. But will their skills in the use of these communication forms match the youth, the so-called net-generation? The debate is high, how will the Internet influence the next generation? [Erstad, 1998] Sherry Turkle writes about "lives on the screen." [Turkle, 1996]

Will the next generation have completely different conceptions of communication, media choice, and media use? And will this cause a 'generation mismatch'. A mismatch which will put a new meaning to the expression 'generation gap' when it comes to communication? And will the research done hitherto become outdated and simple wrong?

The answers of these questions will influence most of us, and it will be extremely interesting to follow the development. People do not use bad communication tools if there are other possibilities. The Caesar team did only use the tools they were comfortable with, and managed without video-conferencing and an ESOP database. Hopefully, the users will be equally ungrateful in the future.

# Appendix A

## Interview Guide

(This is an English translation. The probes were not used much, they did not hesitate to speak. I used it mostly as a checklist to see if everything was covered and sometimes asked a question or two.)

*Interview guide used to get an understanding of the group members' thoughts on their communication situation, satisfaction/dissatisfaction, improvements, and how they think when they choose communication medium.*

**Question:**

Can you say a few words about your background and your experiences with Lotus Notes, email, and general computer knowledge?

**Question:**

Caesar has been presented as a very different project in Statoil when it comes to the organization. Could you say something how you think the project is different and about how you organized the work?

**Probes:**

- compared to Statoil's demands for project organization,
- Gantt diagram,
- specifications,
- the way meetings have been carried out,
- the interaction between the different members,
- use of ESOP,
- use of informal meetings,



- characteristics of Caesar as a task,
- dividing of work / collaboration,
- coordination,
- leadership
- relations to the rest of Statoil
- differences between planned and real organization?

**Question:**

You work in different cities, and use Notes, telephone, meetings, and so on to keep in touch. How have you cooperated practically?

**Probes:**

- OBS: why he/she chooses to do things like that,
- on different tasks?
- unaccustomed?
- what and why has he/she used email for?
- the use of ESOP,
- rules of thumb?
- learned somewhere or own experience?
- alternatives considered, but not used?
- consciousness on choice

**Question:**

What do you think about the way of working, both when it comes to the organization and the cooperation between you?

**Probes:**

- belonging in the Caesar team,
- part of the job in the team,
- what has been the personal gain?

- how has it been to be a part of Caesar and his/her own unit at the same time?
- satisfaction

**Question:**

Now we have been talking about how it to cooperate with people who do not work at the same location as you. Do you have any wishes or needs when you look at how things could or should have been?

**Probes:**

- improvement of existing solutions,
- new solutions,
- Notes,
- email,
- video-conferencing,
- project organization

**Question:**

I would like to describe a fictitious project for you: You are the project manager of a project with four persons located in Oslo, Bergen, Trondheim, and Stavanger. The project is spanning one year, and your task is to create a report with recommendations for how Statoil shall use the intranet in future projects. This report shall be in an electronic form. Can you use a time axis from the 1st of January to the 31st of December to plan how you shall organize the project and how you shall organize the contact between the members?

**Question:**

As a finish I have made a small overview of different ways of communicating with others. Could we together go through this, and fill out how you experience what the different forms are suitable for, and what they are not suitable for?

# Appendix B

## Email coding

Codes suggested after studying the message database:

CO: Coordination of activities, meetings etc.

CO-RE: Deciding on who is responsible for which tasks.

RE: Refining the Caesar concept

PL: Planning of the coming tasks

PR: Production/Technical stuff

EX: External communication (outside group)

CF: Some sort of conflict

AT: Containing attachments

The codes listed here were the initial codes found after reviewing the email database. I then started to search in the literature to find task classifications.

The codes eventually used in the first-level analysis were based on McGrath's typology of tasks. [McGrath, 1990] They covered and extended the list above. Each main task type was given a code, and all the messages were then coded according to this set of codes. The codes are presented below, together with a description of how the codes were used:

**GE-ID Idea generation** Messages written to get some kind of creative response were put in this category.

**GE-PL Plan generation** All messages with references to coming events or locations were coded as GE-PL messages.

**CH-SO Problem solving (Choosing)** This category is described by McGrath as tasks finding solutions with a specific, correct solution. In knowledge work, most problems have no correct solution, and the messages in this category were limited to technical problems.

**CH-DE Decision making (Choosing)** When two or more members of the core team were about to take a decision, and were discussing this decision, the messages were put in the CH-DE category.

**NE-VI Negotiation, conflict of viewpoint** McGrath argues that most conflicts are categorized as conflicts of interest, but that hidden behind this conflict of interest, you will often find persons with completely different viewpoints, ways of analysing, attitudes, moral, and judgments. These conflicts, also often called cognitive conflicts in the psychology literature, will then go further than just pay-off competition and immediate goal conflict. As a participant observer I have had the opportunity to watch closely the different conflicts occurring, and can therefore classify viewpoint and interest conflicts after looking at the history, and the individuals' personalities, attitudes etc.

**NE-IN Negotiation, conflict of interest** Messages in this category will be messages handling more immediate conflicts of interest.

**EX-PO Execution, conflict of power** Only one message ended up in this category. Although conflicts of power and influence can be the motive behind other messages too, I had no information to conclude in other cases than this message.

McGrath describes the category this way: "*Resolving conflicts of power; competing for victory. e.g. wars, winner-take-all conflicts, competitive sports, key notion: Winning.*"

**EX-PE Execution, performance** According to McGrath the execution, performance task type includes psycho-motor tasks, but he also writes: "*Performances are those overt task executions that do not involve competition against an enemy, but rather involve striving to meet standards of excellence (or, sometimes, standards of 'sufficiency'), with pay-offs tied to such standards rather than to 'victory' over an opponent.*"

The meta and meeting categories were additional, i.e. all messages have also been categorized in one of the categories above.

**Meta** In the meta category, I gathered the messages with some kind of meta comments. Mainly they can be put into two types: Comments on cooperation or relations between people, and positive, personal remarks.

**Meetings** All messages with summons and minutes of meetings were put in the meetings category.

After the initial coding, it became clear that a more detailed coding of the categories EX-PE and GE-PL was necessary. After plundering into these two categories, EX-PE ended up with five new categories:

- EX-PE-OP for comment or opinion,
- EX-PE-RE for request for information,
- EX-PE-IN for information delivery, and
- EX-PE-EX for contact with people outside the core team.
- EX-PE-CO for request for comment or opinion.

Likewise, the GE-PL category got the following sub-categories:

- GE-PL-IN for the planning of informal meetings,
- GE-PL-OR for messages regarding organization of something already planned, and
- GE-PL-FO for the planning of formal meetings.

The distinction between formal and informal meetings is that informal meetings are normally between two or three of the core team members, and the arranging of the meeting resembles a question like this: "Are you available for an hour or two on Monday?"

# Appendix C

## Variables in the Research Framework

Main focus in five items:

- concrete use of technology (how/when/what/why)
- development and functioning of groups
- information acquisition and processing in work settings
- temporal issues in individual and group behaviour

Also combined factors can be found. See [McGrath, 1984, pp. 104-112] for a discussion.

### C.1 Input factors

#### C.1.1 Member attributes

- social and communicative skills
- attitude
- existing social networks
- personal background
- personality
- personal agenda

- motivation
- psychological needs (need for information/Festinger, FIRO p. 55 Group Dynamics, social support)
- technology experience
- task experience

**C.1.2 Group attributes**

- group development
- group composition (age, gender, task ability/experience, education,...)
- structure (roles, communication network, interpersonal attraction, authority)
- power distribution
- group size
- group atmosphere
- member changes
- cohesiveness
- leadership

**C.1.3 Task attributes**

- McGrath's circumplex, Shaw's classification (six characteristics), Laughlin's task classification, characteristics like degree of divisible, quality vs. quantity, individuals input related to outcome (Steiner's task typology)
- change of task characteristics
- complexity
- group's control over task
- how well-defined the tasks are
- uncertainty
- degree of task agreement
- degree of group tension related to task

### **C.1.4 Technology attributes**

- functions and possibilities
- asynchronous/synchronous
- same time/same place/different time/different place
- diversity of functionality
- user interface
- accessibility
- restrictions on use/limitation in technology
- technology problems
- patterns of use
- learning
- possibilities for individual adaptation
- characteristics of technology introduction and education

### **C.1.5 Context factors**

- managers
- peers
- organization
- norms
- other projects
- intergroup conflicts
- situational factors (practical matters, space/time constraints, etc.)
- external changes
- history (organization-/personal-/project-)
- physical characteristics of surroundings



## **C.2 Process variables**

### **C.2.1 Participation**

- amount of participation per member, topic, quality distributed over time
- relative participation (to member, role,...)

### **C.2.2 Information processing**

- characteristics of sharing
- redundancy
- integrative complexity
- problems encountered
- information overload
- sorting of relevant and irrelevant information
- hidden information (both of practical causes and intentional causes)

### **C.2.3 Consensus generating/communication**

- atmosphere
- handling of conflicts
- handling of different viewpoints
- amount and intensity of disagreement
- conformity pressure
- level and amount of meta-communication
- outcome of conflict
- non-verbal communication

### **C.2.4 Normative regulation**

- existing norms
- development of norms
- groupthink
- explicit norms and rules
- implicit norms and rules
- expressions of commitment, satisfaction and solidarity

## **C.3 Output factors**

### **C.3.1 Task performance**

- quality
- quantity
- speed and costs
- managers'/customers'/organization's judgment of performance
- group's judgment of performance

### **C.3.2 User reactions**

- satisfaction with process and outcome
- view on usefulness of outcome
- view on other members' participation and performance
- feelings of belonging
- feelings of benefit as a member
- feelings of self-realization

**C.3.3 Member relations**

- interpersonal attraction
- feelings of impersonality

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