



**KTH Computer Science
and Communication**

Situated Reflexive Change User-centred Design in(to) Practice

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Front cover picture: some of my colleagues at KTH during a workshop.
Photographer: the author.

All illustrations in the thesis are by Fredrik Ahnmé Eriksson, except for figure 7,
page 49 (the three personas) which is by Rikard Hilding.

To my parents, who taught me that there is always more to learn.

Abstract

Technology used in the Swedish workplace is perceived to be controlling, generally still difficult to use, and with a low degree of usability. Even though the field of Human-Computer Interaction (HCI) has been concerned with researching different ways of developing usable systems for at least half a century, there seem to be problems with the diffusion of the results into practice. One of the possible approaches to developing usable systems is user-centred design, and in this thesis I am concerned with the issue of introducing user-centred design and usability work in public authorities and institutions. I will present work done in two different research projects with a focus on change, where the aim has been to introduce or enhance usability work. Through a lens of social constructionism and reflexivity I will explore the outcome of the projects and the implications for the introduction of user-centred design in practice. Furthermore, I will explore whether the focus on the introduction of usability work might hinder the formation of a sustainable change in the organizations interested in developing usable systems. The research question then becomes; can we introduce usability work in organizations?

The answer to this question is no. Instead, we need to change our perspective from introduction to *situated reflexive change*: focusing on sensemaking and a situated process of ongoing change, where the stakeholders in the organization themselves must play an active and responsible part. This entails a shift from dualism to duality and a reconsideration of what our usability methods can contribute with. Furthermore, I will explore possible approaches to working with situated reflexive change with tools that are familiar in the field of HCI, but with an expanded scope. In particular I will discuss field studies conducted by system developers as a tool for making sense of usability issues, personas as a tool for inducing reflexivity in and on practice, and usability coaching as a sensemaking tool for both organizational stakeholders and researchers in order to understand and reflect upon change.

Svensk sammanfattning

IT-system och datorer har blivit en naturlig del arbetsplatsen och vi spenderar allt mer tid framför våra datorer i vårt arbete. Trots att man har inom forskningsfältet Människa-datorinteraktion under det senaste femtio åren forskat på tillvägagångsätt för att utveckla användbara system har forskningsresultaten inte nått ut i praktiken i tillräckligt stor utsträckning. IT-systemen upplevs fortfarande som otillräckliga. Svenska tjänstemän har i en undersökning av fackförbundet Unionen beskrivit hur IT-systemen styr deras arbete på ett onödigt sätt, att systemen är svåra att använda och har låg användbarhet. Ett tillvägagångsätt för att utveckla användbara system är användarcentrerad systemdesign. Arbetet i den här avhandlingen berör hur man kan introducera användarcentrerad design och användbarhetsarbete i statliga myndigheter. Målsättningen för arbetet har varit att förbättra arbetsmiljön för de anställda genom att få myndigheterna att beställa och utveckla mer användbara system. I denna sammanläggningsavhandling kommer jag presentera forskning som har skett inom två projekt där målet har varit att introducera eller förstärka redan existerande användbarhetsarbete. Min grundansats i denna avhandling är socialkonstruktionism och reflexivitet, och med dessa som verktyg kommer jag belysa forskningsprojekten och deras utfall, med målsättningen att beskriva konsekvenser för att introducera användbarhetsarbete i praktiken. Jag kommer också diskutera introducerandet som koncept. Kanske står detta som ett hinder för en hållbar förändring i organisationer intresserade av att utveckla användbara och användarcentrerade system. Forskningsfrågan i denna avhandling är således, kan vi introducera användbarhetsarbete i organisationer?

Mitt svar i denna avhandling är nej. Vi kan inte introducera användbarhetsarbete. Jag kommer här istället argumentera för en perspektivförändring, vi måste gå från att introducera till att engagera oss i situerad reflexiv förändring. Centralt i denna perspektivförändring är ett fokus på meningsskapande och på en situerad förändringsprocess där involverade intressenter i de berörda organisationerna själva måste engagera sig aktivt i förändringsarbetet. Dessutom bör Människa-datorinteraktion som forskningsfält omvärdera vad våra användbarhetsmetoder kan bidra med. Jag kommer också i denna avhandling utforska några möjliga tillvägagångssätt för att arbeta med situerad reflexiv förändring, med verktyg som till synes är familjära för ämnesområdet, men för vilka jag har gjort en utvidgad

analys. Jag kommer diskutera fältstudier utförda av systemutvecklare som ett verktyg för att skapa mening kring användbarhetsfrågeställningar, personas som ett verktyg för att locka till reflektion om praktik, och användbarhetscoaching som ett verktyg för meningskapande i förändringssituationer, såväl för intressenter i organisationer som för forskare.

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals. Reprints were made with kind permission from the publishers.

Paper I

Eriksson, E., Å. Cajander and J. Gulliksen (2009). *Hello World! – Experiencing Usability Methods Without Usability Expertise*. INTERACT2009. Eds.: T. Gross, J. Gulliksen, P. Kotzé et al. Heidelberg, Springer. LNCS 5727: 550-565.

This paper is a case study of one of the activities within the CSN-project, see paper V. The focus of this paper is the developers and their experiences of doing field studies for the first time, both in an educational as well as in a practical context. The paper discusses the implications these field studies might have for system development. The empirical material is based on interviews, participant observations, survey and written documents. The main result is that field studies were beneficial and appreciated by the system developers, they felt that they got a more holistic picture of system development. However, the results also show that the usability professional is still needed for a more thorough analysis of the use situation.

I am the main author of this paper, I planned the study and conducted all the interviews with the developers as well as the participant observations. Furthermore, I did the analysis of the data partly on my own and partly in collaboration with the other authors.

Paper II

Cajander, Å., E. Eriksson and J. Gulliksen (2010). *Towards a Usability Coaching Method for Institutionalizing Usability in Organisations*. HCIS 2010. Eds.: P. Forbrig, F. Paternó and A. Mark Pejtersen. Boston, Springer. IFIP AICT 332: 86-97.

The study in this paper was part of the CSN-project, see paper V. The paper presents a new method to the HCI-field, usability coaching. The paper presents theory on coaching and a case study where usability coaching was used. The empirical material is based on the coaching sessions in themselves, and interviews done at the end of the CSN-project. The results show that the usability coaching made the individuals receiving coaching more aware of how their professional role might work with usability issues, but also that the coaching program should have started earlier in the research project.

I conducted all the interviews used in the paper. Furthermore, I took part in the analysis of the empirical material and in writing of the paper.

Paper III

Eriksson, E., H. Artman and A. Swartling (2013). *The secret life of a persona - when the personal becomes private*. In Proc. CHI 2013, (Accepted)

This paper presents two cases where personas have been used within the Swedish Armed Forces. The second case, which I was part of, was conducted within the FMV-project, see paper IV. The methods used in these cases were participatory development of the personas through interviews and workshops. The personas created in these cases differ from how personas are usually portrayed in the literature, since they have little or no personal details. The personas were, nevertheless, positively received, and this is elaborated on in the paper.

I am the main author of this paper, and conducted one of the cases described in the paper together with the third author. I did the analysis in collaboration with the other authors.

Paper IV

Eriksson, E. and A. Swartling (2012). *UCD Guerrilla Tactics: A Strategy for Implementation of UCD in the Swedish Defence*. In Proc. HWID'12, Electronic proceedings, <http://openarchive.cbs.dk/handle/10398/8600>, 116-126

This paper summarizes a research project at the Swedish Defence Material Administration (FMV) and the Swedish Armed Forces (SwAF) with the aim of introducing usability work in the early phases of system development. The

research methodology was change oriented, with attempts at collaborating with the organizations involved. The empirical material is based on interviews and workshops, written documentation and participant observations. The results from the paper is that change was hard won, and the main contribution of the paper is the notion of introducing UCD (User-centred Design) with UCD and the implications thereof.

The paper results from an equal collaboration between the second author and myself.

Paper V

Gulliksen, J., Å. Cajander, B. Sandblad, E. Eriksson and I. Kavathatzopoulos (2009). *User-Centred Systems Design as Organizational Change : A Longitudinal Action Research Project to Improve Usability and the Computerized Work Environment in a Public Authority*. International Journal of Technology and Human Interaction 5(3): 13-53.

This paper is a presentation of a longitudinal action research project at a public authority. The aim of the project was to increase the focus on usability issues at Swedish National Board of Student Aid (CSN), and this paper elaborates on organizational change issues: both success factors and pitfalls encountered during the project. The main empirical material derived from interviews at the end of the research project.

I was one of the researchers participating in the project and took part in most of the interviews used as empirical data in the paper. My main contribution to the paper is the methods section. Moreover, these interviews are the main material in the paper.

About co-authors

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Bengt Sandblad	Professor in the Department of Information Technology – Visual Information and Interaction, Uppsala University
Anna Swartling	PhD, Usability Architect at Scania CV AB, Södertälje

Publications not included in this thesis

The following publications have been part of my thesis work, but are not part of this thesis:

- Cajander, Å. and E. Eriksson (2007). *Automation and E-government Services: A Widened Perspective*. In Proc. The 1st International Workshop on Design & Evaluation of e-Government Applications and Services: DEGAS,
- Cajander, Å., E. Eriksson and J. Gulliksen (2007). *Evaluating Procurement, Usability and Off-the-Shelf Office Software*. In Proc. COST294-MAUSE Workshop - Downstream Utility, IRIT, Toulouse, 22-29
- Cajander, Å., E. Eriksson, J. Gulliksen, I. Kavathatzopoulos and B. Sandblad, *Användbara IT-stöd : En utvärdering av ett forskningsprojekt vid CSN, Centrala studiestödsnämnden*, 2008, Report Number: 1404-3203, Technical Report
- Eriksson, E. (2007). *Sensemaking and Knowledge Building in System Development*. In Proc. 11th IFIP TC 13 International Conference, INTERACT07, Springer 571-572
- Eriksson, E., (2009). *Making Sense of Usability - Organizational Change and Sensemaking when Introducing User-Centred Systems Design in Public Authorities*, Licentiate thesis, 2009-002, Uppsala University, Uppsala
- Eriksson, E., Å. Cajander and J. Gulliksen (2008). *Introducing Usability Roles in Public Authorities*. In Proc. NordiCHI2008, ACM, 113-122
- Gulliksen, J., Å. Cajander and E. Eriksson (2008). *Only Figures Matter?: If Measuring Usability and User Experience in Practice is Insanity or a Necessity*. In Proc. International Workshop on Meaningful Measures: Valid Useful User Experience Measurement, IRIT, Toulouse, France, 91-96
- Gulliksen, J. and E. Eriksson (2006). *Understanding and Developing User Involvement at a Public Authority*. In Proc. User involvement and representation in e-Government projects. Workshop at NordiCHI 2006, SINTEF report A314

Abbreviations

AR	Action Research
COTS	Commercial off-the-shelf
CSN	Centrala Studiestödsnämnden (Swedish National Board of Student Aid)
EA	Enterprise Architecture
FMV	Försvarets materielverk (Swedish Defence Material Administration)
FOI	Totalförsvarets forskningsinstitut (Swedish Defence Research Agency)
HCI	Human-Computer Interaction
HR	Human Resources
IS	Information Systems
IT	Information Technology
KTH	KTH -Royal Institute of Technology
SwAF	Försvarmakten (Swedish Armed Forces)
UCD	User-Centred Design
UCSD	User-Centred Systems Design
UML	Unified Modelling Language

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Writing a thesis is a singular experience, and someone close to me compared it to a marathon race. However, although you run the race all by yourself, there are numerous people who have been essential for me to cross the goal line.

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Tumba, 2013-01-07

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Prologue

This thesis starts with a story of practice: the practice of developing computer systems for work. Imagine a freshly baked computer scientist with a keen interest in human-computer interaction arriving at a small firm developing an internal booking system for the test equipment of a global telecommunication enterprise. The title of the job application was “GUI-expert”, and the computer scientist was thrilled. This was the perfect situation to combine her knowledge of programming, computer science and usability. Everything seemed to be orderly and rational; the firm even had a personal development plan for every employee.

One year later I became a PhD-student. Yes, this is me we are talking about. What happened during that year that made me apply for a PhD-position, even though I had a well-paid and stimulating job? Because it was stimulating – stimulating, chaotic and not even close to the ordered reality of the usability methods I had learnt at school. During that year I struggled, again and again, with applying the usability methods and with explaining what usability entailed. I argued in vain that we needed more access to the users, that we needed to discuss the requirements in more detail and that we actually had no clue of the context of use. I did all but develop user interfaces and felt that the development process went in the wrong direction: we even wrote user stories after the system was built. My only consolation was that I had started to slowly plant some seeds of knowledge in the requirement analyst at the firm and that I had at least revised the manual of the system; it now had pictures in it. Small victories.

This is where the story of this thesis begins, with one leg in practice and the other in the world of research, with a hope of finding the answer to my question: how can we make usability work in practice?

1 Introducing, Promoting, Enhancing

I'll make my report as if I told a story, for I was taught as a child on my homeworld that Truth is a matter for the imagination. The soundest fact may fail or prevail in the style of its telling ... The story is not all mine, nor told by me alone. Indeed I am not sure whose story it is; you can judge better. But it is all one, and if at moments the facts seem to alter with an altered voice, why then you can choose to the fact you like best; yet none of them are false, and it is all one story.

(Ursula K. Le Guin, The Left Hand of Darkness)

Everything changes, nothing stays the same. It is an old saying, but perhaps it is even more applicable in our age of new and cheaper technology that increasingly becomes more powerful, all-encompassing and ubiquitous. Work practice has changed radically with computerization; mundane tasks have become automated, and yet we spend more time in front of the computer screen than before. More than half of the white-collar workers in Sweden spend more than six hours in front of the computer during their work hours according to a survey by Unionen (Unionen 2010). The systems they are using are beneficial in some respects. One example is communication with colleagues and other departments at work, but they (still) find that the systems to a large extent control their work in an unnecessary and burdensome way (Unionen 2010). The usability of the systems is perceived as good by only half of the respondents. Moreover, the survey shows that the white-collar worker's influence on the future work practice and technology is low (Unionen 2010), which is a result that is also shown in a similar study concerning IT in medical settings (Users Award 2010). In conclusion, things have changed, but not enough, and not always for the better.

Nothing changes, everything stays the same. Research on computer use and usability has been going on for over 40 years. Yet user involvement and the usability of the systems is still not improving, at least not in the work practice of white-collar workers and medical staff in Sweden (Unionen 2010). The field of Human-Computer Interaction (HCI) has long known that user involvement is necessary for the successful implementation of systems, and usability has been defined, contested and even become a standard. Furthermore, there is a multitude of methods and activities aiming at informing development by eliciting

user needs, finding usability problems and evaluating systems. Yet it seems this has not permeated practice – at least not in public authorities in Sweden. What is then the problem: the usability methods or the practice? Or is it our way of introducing usability into practice that is the problem?

1.1 Research Objective - Introducing Usability Work

The research presented in this thesis and in the papers included (paper I-V) is deeply embedded in practice. The overarching aim of the projects I have been part of, has been to promote, introduce and enhance usability work in the participating public authorities; Centrala Studiestödsnämnden¹ (CSN) and Försvarets Materielverk² (FMV). The idea was to arrive at more usable and less stressful systems for the end-users of the systems; the case handlers at CSN and the soldiers in the Swedish Armed Forces (SwAF), through the application of different usability principles, methods, activities and processes. The focus was not on developing new systems per se, rather to help the organizations themselves to improve their procurement and development processes so that they in turn could develop more usable systems. Central in these efforts are the concepts of usability and user-centred design.

1.1.1 Usability and User-Centred Design

Usability is a basic concept within the field of HCI both in practice and in research, and is used in general as a description of a system, as a quality criterion out of many. Different definitions of usability can be found in the HCI literature, yet the concept as being used in the industry has been defined in an ISO standard:

[Usability is] the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. (ISO 1998)

-
1. The public authority in Sweden that handles financial aid for students, mainly loans and grants for studies.
 2. The Swedish Defence Material Administration, the research project was situated in this organization, although the research also comprised the Swedish Armed Forces (SwAF).

Usability plays an important role in the work environment of the public authorities I have been involved in. There is a need to focus on effectiveness, efficiency and satisfaction, supporting the work tasks in these organizations in order to prevent issues of stress and ill-health. The usability concept is criticized, however, as being too focused on measurement and the instrumental value of systems, and that the concept to some degree excludes other values such as aesthetics, embodiment, emotion and experience (Hassenzahl and Tractinsky 2006). Although it has been criticized, it has been one of the core concepts in my research and an initial delimitation of this thesis is that it concerns usability as defined by the ISO-standard.

How to develop usable systems is a central topic within the research field of HCI, and there are numerous methods, activities, methodologies and processes that aim at developing usable systems and evaluating their usability. In my research one of the core concepts has been user-centred design (UCD) (Gould and Lewis 1985; Mao, Vredenburg et al., 2005). User-centred design could be regarded as an umbrella concept for different methods and methodologies that have the user in focus, although the users are not always directly involved in the development of these systems (Karat 1997; Iivari and Iivari 2010).

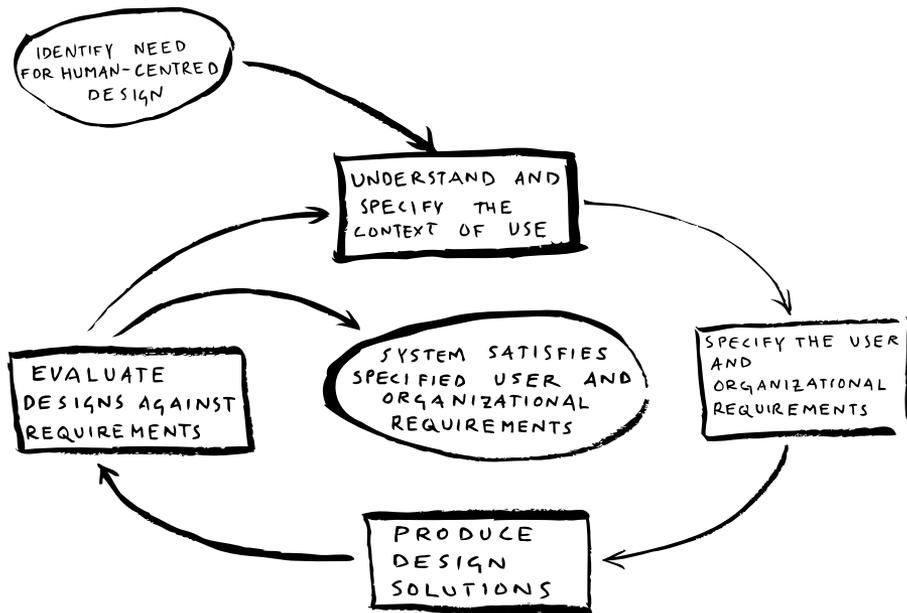


Figure 1. The user-centred design cycle, as defined by ISO 13407:1999, picture adapted from (ISO, 1999).

User-centred design is also defined in the industrial standard “Human-centred design processes for interactive systems,” (see figure 1 for an illustration of the process) and the approach should include:

- a) the active involvement of users and a clear understanding of user and task requirements
- b) an appropriate allocation of function between users and technology;
- c) the iteration of design solutions;
- d) multi-disciplinary design. (ISO 1999, p. 7)³

User-centred design has been criticized for being vague and unspecific, and as a remedy to this Gulliksen et al., have defined 12 key principles for user-centred systems design (UCSD) (Gulliksen, Göransson et al., 2003). The principles are, among other things, based on the ISO-standard, but are also, for example, influenced by the Scandinavian school and participatory design (Bannon 2009; Sundblad 2011). The twelve principles in short are:

1. User focus – the goals of the activity, the work domain or context of use – the users’ goals, tasks and needs should early guide the development.
2. Active user involvement – representative users should actively participate, early and continuously throughout the entire development process and throughout the system lifecycle.
3. Evolutionary systems development – the systems development should be both iterative and incremental.
4. Simple design representations – the design must be represented in such ways that it can be easily understood by users and all other stakeholders.
5. Prototyping – early and continuously, prototypes should be used to visualize and evaluate ideas and design solutions in cooperation with the end users.
6. Evaluate use in context – base-lined usability goals and design criteria should control the development.
7. Explicit and conscious design activities – the development process should contain dedicated design activities.

3. ISO 13407:1999 has been developed further, and the new standard is ISO 9241-210:2010. I have chosen to use the old standard here, since this was the standard we referred to during the projects.

8. A professional attitude – the development process should be performed by effective multidisciplinary teams.
9. Usability champion – usability experts should be involved early and continuously throughout the development lifecycle.
10. Holistic design – all aspects that influence the future use situation should be developed in parallel.
11. Processes customization – the user-centred systems design process must be specified, adapted and/or implemented locally in each organization.
12. A user-centred attitude should always be established. (Gulliksen, Göransson et al., 2003, p. 409)

Although the key principles are important, the main point in the paper is “that applying UCSD requires a profound shift of attitudes in systems development, and our main goal is to promote that attitude shift” (Gulliksen, Göransson et al., 2003, p. 397).

Several studies try to explore to what degree UCD has been adopted in industry, but they often concern consumer-product companies (Venturi, Troost et al., 2006; Bygstad, Ghinea et al., 2008) or the respondents are mainly usability professionals (Mao, Vredenburg et al., 2005), excluding those organizations where user-centred design has not been successful. In the HCI literature there are many examples of research projects (with an emphasis on research) where a UCD approach has been used (see for example, Wever, van Kuijk et al., 2008; Marti and Bannon 2009). The literature on introducing or implementing UCD in organizations is, however, more scarce. This thesis concerns the introduction of UCD in Swedish public authorities with either in-house development (CSN) or contract development and procurement of COTS (commercial off-the-shelf) (FMV). This work rests on previous research by the research groups I have been a part of, for example methods for building usable systems (Göransson 2004) and the introduction of user-centred design in the system development process (Boivie 2005), the need to attend to earlier phases of development such as the procurement process (Swartling 2008) and the need to address the whole organization when introducing UCD (Eriksson 2009; Cajander 2010). This thesis extends this work both with empirical findings and theoretical contributions, but foremost I want to challenge our assumptions about the introduction of usability work in organizations: could it be otherwise?

1.1.2 Research Question

Although the overarching and practical aim of my research has been to introduce usability work in organizations, this thesis takes another point of view. What if this aim is incorrectly formulated? What if the aim was not taken for granted, and, instead, the research question for this thesis becomes:

Can we introduce usability work in organizations?

This is a rather bold question, and it challenges all the work I have done up until now. However, I also believe that it is a liberating question that opens up for reflection and creativity. With my empirical findings and the theoretical underpinnings I present in this thesis, I will state that the answer to this question is, No.

We cannot introduce usability work, since it is not a thing that can be introduced; instead usability work is both knowledge and knowing embedded in practice. Furthermore, usability work, as practice, is constituted of recurrent, situated actions, and, because of the situatedness, these are difficult to transfer to another organization. But there will be a brighter ending in my thesis: I will present and discuss *situated reflexive change*. We need to shift focus from introducing to acting as change agents, acknowledging the need for motivating and orchestrating change. Furthermore, I will explore possible approaches to working with situated reflexive change with tools that are familiar to the field of HCI but with an expanded scope. In particular, I will discuss field studies conducted by system developers as a sensemaking tool, personas as a tool for inducing reflexivity in and on practice, and usability coaching as a tool for making sense of change.

1.2 How to Make Sense of this Thesis

This is the storyline of this thesis. In the next section *Approaching Research*, I will present the research approach I have used: action research. The use of this research approach has been both explicit and implicit, depending on the organizational context. By presenting the research approach here, I will be setting a backdrop for the empirical work of the thesis. Action research is an approach suitable when doing research in practice, since it has a dual aim of both problem solving and constructing new knowledge. Furthermore, in this part of the thesis, I will also touch upon reflexivity and social constructionism. I position myself as a social constructionist, which means I believe that my perception

and knowledge of the world is a construction, based on my social situatedness. The world exists independently of me, but there is not any objective truth for me to find “out there,” only representations, constructions and interpretations. Likewise, this thesis and my research in general cannot represent an objective truth; it can only be a construction made by me. This does not mean that the research is pointless and empty, but the process of social construction needs to be elucidated so that readers of the text can themselves judge whether the research and its results are plausible and relevant or not. Furthermore, in this section in the light of these theoretical underpinnings, I will discuss the research methods I have used in my thesis work. The particular methods are presented in the papers (I-V), but here I extend the discussion further.

After this, I will delve into reality in *Introducing in Organizations*. Here I will present the research at CSN and at FMV (based on paper IV and V); the impediments I encountered and theories about organizations, organizational change and sensemaking⁴. My argument here will be that we are not only introducing user-centred design, but we are actually working with organizational change. Furthermore, I will challenge the notion of whose practice we are trying to introduce. The recurring theme in HCI is that the researchers are trying to do user-centred design in organizations, but it is not the researchers’ practice that the organization needs. And if it is not the researchers’ practice, whose practice should be introduced? This story will argue for recognition that we can not introduce usability work into organizations, but, instead, we have to engage in *Situated Reflexive Change*. Here I present the main contribution of this thesis: what we can do, focusing on the idea that getting user-centred design into organizations must be an effort at collaborative change. Furthermore, I will describe three possible tools for this effort to promote change based on methods that are familiar to the HCI field. However, I will discuss them from a slightly different perspective than what is usual, using theories about knowledge/ing and order/unorder to review what the methods are and what they can contribute with. The tools are field studies, usability coaching and personas (based on paper I-III). Ultimately, I will make a *(Re)capitulation*: usability work is not something that we can introduce in organizations, but rather it is based on situated recurrent actions, and, as such, implies a need for a sensemaking process, a situated reflexive change. Furthermore, I will here be wrapping up the thesis with implications for the field of HCI. Lastly, in *Up and Beyond*, with the argument and analysis behind me, I will present some ideas for future work.

4. There are multiple ways of writing sensemaking, but here I will use the word “sensemaking” to mean the theoretical concept and “sense making” referring to the everyday activity.

2 Approaching Research

*As many truths as men. Occasionally, I glimpse a truer Truth,
hiding in imperfect simulacrum of itself, but as I approach, it
bestirs itself & moves deeper into the thorny swamp of dissent.*

(David Mitchell, Cloud Atlas)

The overarching aim of the projects I have been part of has been to promote, introduce and enhance usability work, and this entails a focus on change and, in particular, to do something out there to promote this change. Action is needed for anything to happen, and yet we should also contribute to the research community. Taking these two issues into consideration, action research is a suitable research approach.

2.1 One Approach

As a researcher interested in action research, the amount of literature available is overwhelming, and the descriptions of the methodology or approach can differ widely. Some examples of areas where action research is used are: educational research, organizational science, working life science, and information systems.⁵ Consequently action research has become more or less an umbrella term for a wide variety of methodologies and methods. Therefore, I will here define what I argue are central issues in action research, which my research adheres to, namely: (i) a dual aim: both working with solving a problem in practice and constructing scientific knowledge; (ii) iterative development of the research project; (iii) collaboration, and (iv) aiming at sustainable change. Below I will elaborate further.

My research interest lies in practice, not only understanding it, but solving problems in practice, which entails a focus on change. This could be achieved through

5. Information Systems (IS) or sometimes referred to as Management Information Systems (MIS) is an adjacent field to HCI. Interesting to note here is that there is a prominent body of research on HCI in a sub-discipline of IS (Zhang, Li et al., 2009). The HCI research field and the HCI sub-discipline have evolved side by side with little dissemination of results between the fields (Zhang and Dillon 2003). Zhang et al., conclude that the main body of HCI studies within IS has been on IT use and impact and not IT development. Furthermore, the research has had a focus on individual or group level and not on an organizational level (Zhang, Li et al., 2009).

consultancy, but as a researcher I am engaged in constructing knowledge that can be spread to a wider domain than the particular organization where the change has happened. Hence my research has the dual aim of improving practice, as well as developing scientific knowledge, what McKay and Marshall (2001) denote as the dual imperative of action research. They argue in their paper that researchers should view the action research cycle as not one but two cycles, one problem-solving and one the research cycle. The authors claim that by being clear on this, researchers dispel the criticism that action research is only consultancy. At the same time it can make the researchers pay more attention to their research interests as well as their responsibilities to the problem-solving goal of action research. The dual aim has implications for the entire research project, since there is a need to simultaneously undertake action and reflect upon the same actions. Reflection is important here, since focusing only on problem-solving might be problematic:

... with this emphasis on problem solving, we ignore problem setting, the process by which we define the decision to be made, the ends to be achieved, the means which may be chosen. In real-world practice, problems do not present themselves to the practitioner as givens. They must be constructed from the materials of the problematic situations, which are puzzling, troubling and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of an uncertain situation that initially makes no sense. (Schön 1983, p. 40).

Real life settings are never clear and unambiguous and making sense of this situation and solving the problem includes framing and defining the problem. Hence, engaging in the practice leads to a probing process that is cyclical, iteratively working with framing the problem, action-taking and reflecting on the outcome, see figure 2 (for a summary of common cyclical descriptions, see (McKay and Marshall 2001)).

Real life settings also have implications for how the action research project is set up, since it: "... requires those who experience or 'own' the real world problem to be actively involved with the researcher at least in selecting the problem and sanctioning the search for solutions" (Elden and Chisholm 1993, p. 129). This is what Avison et al., call control structures, how to start the project, the formulation of the problem that should be addressed and giving authority to do the action (Avison, Baskerville et al., 2001). Their conclusion is that the control of the project must be shared, but the control initiatives will change during the

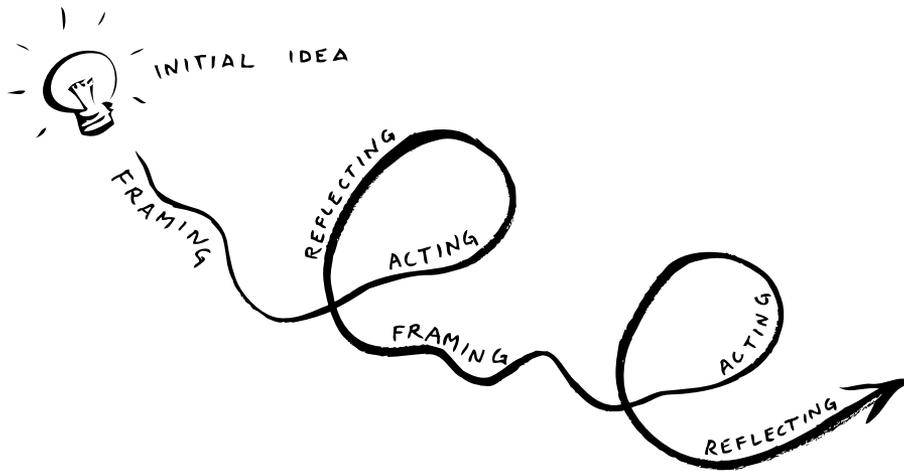


Figure 2. Action research is a cyclical process, where action and research are affected by the setting and previous activities.

project. Collaboration is a delicate matter, but it is also a safeguard to ensure that the problem addressed is a relevant problem and not only a research construct that will not benefit practice. Of course there are problems with collaboration, since issues of power come into play and the action researcher must engage in a reflective process in order to not dominate the situation.

Finally, the main aim of action research, in my view, is a sustainable change, not only to solve the immediate problem at hand, but also to help the organization to learn how to handle the problem-setting in the future. In some sense, the action researcher should strive for a situation where the action researcher is not needed anymore.

However, these are not the only issues, and, above all, the actual implementation of action research is also based on epistemological and theoretical perspectives of the participating researchers (Cassell and Johnson 2006). Consequently, there is not a single set of criteria on how to evaluate action research projects, but the guidance must instead be based on the theoretical underpinnings of the research design and implementation. Cassell and Johnson elaborate on five possible categories of action research depending on the theoretical and epistemological background. The categories are:

1. Experimental action research practices,
2. Inductive action research practices,

3. Participatory action research,
4. Participatory research practices and
5. Deconstructive action research practices. (Cassell and Johnson 2006)

This is only one definition of possible epistemological and theoretical underpinnings; there are most certainly more. Worth noting is that the categories are not distinct. Rather it is a continuum where researchers can be more or less inspired by or following ideas and theories from the different perspectives.

In the light of this categorization, I would argue that my research is situated in the third category: participatory action research which means that the “people in the organization or community under investigation participate actively throughout the whole process, from initial design or problem diagnosis to the adoption of the action strategies” (Cassell and Johnson 2006, p. 796).

We used action research as an approach in the project at CSN, collaborating with people from the entire organization. Furthermore, in the project at FMV we were inspired by, although not explicitly using, action research. The approach at FMV could, however, be labelled engaged scholarship (Van de Ven 2007). Engaged scholarship is a framework for research approaches that enlightens professional practice where action research is one possibility. The research at FMV lacked collaboration, but it could be argued that it could still be situated in and informing practice, resembling informed basic research as described by Van de Ven (2007).

2.2 Position in Construction

Continuing the discussion of epistemology and theoretical perspective, where do I position myself? Epistemology concerns the theory of knowledge and ontology the theory of being (Crotty 1998, p. 3) or theory of the world. These two concepts are somewhat intertwined and are often portrayed in general as a debate between objectivism and subjectivism or positivism and post-positivism. Burrell and Morgan (1979) describes it more as a continuum between two poles, which is a view I share. In the subjectivist stance, reality is constructed solely by the mind of the beholder, and in the objectivist stance, reality is out there, objectively true and ready for us to discover. Constructionism, to which I adhere, can be found somewhere between subjectivism and objectivism, where:

... all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context. (Crotty 1998, p. 42)

Furthermore, I adhere to social constructionism, which refers to the way meaning is created (Crotty 1998), that is, the meaning is socially constructed, and can be meaning about social phenomena or natural phenomena. Alvesson and Sköldbberg argue that social constructionism has different degrees of radicalism, “a critical, a social, an epistemological and an ontological” (Alvesson and Sköldbberg 2009, p. 35), and that it is easy to slide from one position to the other. The mildest form is critical, where it is shown how things that earlier was seen as natural might be socially constructed. With the social it is argued that society is socially constructed; in the epistemological stance it is knowledge and in the ontological perspective it is the reality in itself that is a social construction. This is a slope I have found myself slowly sliding down, towards a more radical position, although with all this said, I have to perhaps confess, just like Finlay, that:

... in the end, I am forced to “come clean” and acknowledge my less-relativist ... position, one which attempts to capture, something of a “real” story while acknowledging its partial, tentative status. (Finlay 2002, p. 224)

This real story is concerned with the practice of systems development and the practice of usability work, which I believe is not a figment of my imagination, but also something existing outside of me, even though I might not fully understand it, fully describe it or interpret all its meanings. But I can use reflexivity as a process of challenging my assumptions of this reality and thereby find multiple interpretations and new meanings.

2.3 Reflecting

Reflexivity is to some degree present in all qualitative research (Finlay 2002), at least in the form of a critical attitude towards research practice (Gough 2003), and it has been part of my own research since the beginning of my PhD-studies, for example through my reading of the *Reflective Practitioner* by Donald Schön (1983). Schön explore the practice of professionals, and how these solve problems with reflection-in-action and develop their expertise through reflection-on-action, in a situated manner different from how they are taught in profes-

sional schools. Furthermore, I have been much inspired by the book *Reflexive Methodology* by Alvesson and Sköldbberg (Alvesson and Sköldbberg 2009), and, as a result of this, I have adopted a reflexive stance in this thesis. Hence, in this thesis, I will reflect on my research in ways that are not present in the papers, and, more critically, I will relate to my work with the empirical material and the interpretations and results in the papers I have written (Alvesson and Sköldbberg 2009, p. 315). What intrigues me with Alvesson and Sköldbberg's approach to reflexivity is that they encourage embracing different strands of theoretical perspectives although not fully adopting them. Their argument is to use key concerns in these strands of theoretical perspectives to question the empirical data and the research at hand. These key concerns then become different levels of reflexivity. Using several levels of reflection is also argued by Gough with his argument that reflexivity on just one level could be restricting (Gough 2003). Finlay accounts for a typology of five types of reflexive research practice: "(i) introspection; (ii) intersubjective reflection; (iii) mutual collaboration; (iv) social critique, and (v) discursive deconstruction" (Finlay 2002, p. 212). However, these are not (usually) employed by the same researcher, since most often a researcher has chosen one reflexive practice. Alvesson and Sköldbberg, on the other hand, have constructed a composite of four levels of reflection, "... the empirical based, the hermeneutic, the ideologically critical and the postmodernist" (Alvesson and Sköldbberg 2009, p. 271), and they argue that researchers should strive to use all the levels in their research. However, they also argue that this is just one out of many composites of reflexive levels, and that the levels, if used, can be emphasized differently. I will endeavour to put these four levels of reflexivity into play in my text in this thesis. However, my aim is not to mechanically apply some method for reflecting on/in the four levels, which is something the authors discourage (Alvesson and Sköldbberg 2009) but rather let the levels be present when I elaborate on my thesis.

2.4 Approaching Methods

It can be difficult and challenging to untangle action and research when one is immersed in a real life setting doing action research. Despite this, I would like to discuss the research methods on a more general level.

Usually when starting on a methods section, the data collection methods are mentioned. However, I do not find data collection especially straightforward, since even in the planning of what empirical data to record, I do an initial inter-

pretation and delimitation. Furthermore, as a researcher, I construct the empirical data, which I think is not explicit in the term collecting. A noticeable example of this construction is my research diary, which I have used extensively throughout my projects. What events, conversational accounts or notes I write down become constructed by me and do not correspond to the reality in any clear objective way. Of course I strive to depict whatever I see as honestly as I can, but this is obviously problematic. Because of this, it is difficult to separate the collection of empirical data from interpretation. Furthermore, the result is interpretations on several levels, what questions I pose, how the respondents make sense of this question and how I interpret the answers given (Van Maanen 1979). To open up the space of possible interpretations and to challenge preconceived assumptions, there are some remedies to be found, for example striving to be reflective in the research process (Alvesson and Sköldbberg 2009), to use the help of other researchers and their empirical data and to use multiple sources of data, as well as multiple methods, sometimes referred to as triangulation. I have mainly used interviews, participant observations, and documents from the organizations as sources of empirical data. In more detail, the material from the CSN-project consisted of 39 audio-recorded and transcribed interviews. The material from the FMV-project consisted of 23 interviews, audio-recorded in all cases except one and transcribed. Furthermore, eight workshops and meetings were also part of the material, out of which five were audio-recorded and transcribed. The detailed description of methods can be found in paper I-V.

As mentioned earlier, I have also carried a research diary, in the form of a notebook. At some point I tried to use an electronic research diary but felt that in the field participating in meetings etc. the computer became an obtrusive artefact, so I went back to the traditional notebook. Even carrying a notebook and scribbling down notes could in some situations be hampering. In these cases, I have written down notes as soon as I could after the activity or event. The research diary (or rather diaries) has been an artefact I have returned to repeatedly in my research, sifting through scribbles of events, making sense of them again and again, in the light of more recent events.

As described above, analysis already starts at the point of recording a situation. Furthermore, analysis has also been done in several different ways. I have mostly done the analysis of interview data by myself, iteratively reading through transcripts, highlighting interesting themes, cutting and sorting. Some of the analysis has been done together with other researchers in the projects, through post-it sessions, writing down events, statements, themes and sorting them into

categories on a large wall. Doing analysis with others is rewarding, since our different understandings, knowledge and interpretations enrich the material. Even though some of the people that we have worked together with in our projects in some sense have been co-inquirers, they have not been part of the analysis process. Their participation in the analysis process could have enriched the material further.

Just collecting and analysing is not sufficient; the results need to be disseminated to the research field (and preferably in practice). Walsham reminds us that “writing is an act of persuasion that is as much about rhetorical flair as it is about care in matters of method and theory” (Walsham 2006, p. 326). The writing process has been one of the most rewarding and one of the most agonizing parts of my PhD studies. Days could go by when not a single line was written, other days it would be as if a dam had burst, words flowing almost painfully fast. The writing process is of utmost importance, since it is through writing that some of my thoughts take form. Writing papers for journals and conferences have focused my work, helped me analyse and find new perspectives in my research and made me visit and revisit the empirical data.

3 Introducing in Organizations

At least I have got at a grip of the essential facts of the case. I shall enumerate them to you, for nothing clears up a case so much as stating it to another person, and I can hardly expect your coöperation if I do not show you the position from which we start.

(Sir Arthur Conan Doyle, Silver Blaze)

This thesis is based on empirical work in two public authorities, Centrala Studiestödsnämnden (CSN) and Försvarets Materielverk (FMV). In an effort to contextualize the results and issues discussed below, I will begin here with a description of the authorities and the projects. Since the research project at FMV also included activities and goals concerning the Swedish Armed Forces (SwAF), SwAF is also included in this description.

3.1 CSN and the Project

The first organization I was involved with was CSN, the public authority in Sweden that handled financial aid for students, mainly loans and grants for studies. It was fairly large and dispersed public authority with around 1100 employees with offices in 13 different locations. Around 350 of these employees worked at the headquarters where most of the computer systems used within the organization were developed in-house. Consequently, the majority of the employees were case-handlers, that is, civil servants working with handling cases. Furthermore, these case-handlers were the end-users of the computer systems developed and the main focus of the action research project. The stakeholders touched upon in this thesis are situated in the IT Architecture department, IT-developers department, the Development department and the case-handlers at the local offices, see figure 3, for an overview.

The action research project with CSN (in this thesis called the CSN-project) lasted for three years, excluding the pre-study, and I started my PhD studies half-way through the project. Over the years there were several researchers from our research group involved, and we worked together with a project group at CSN,

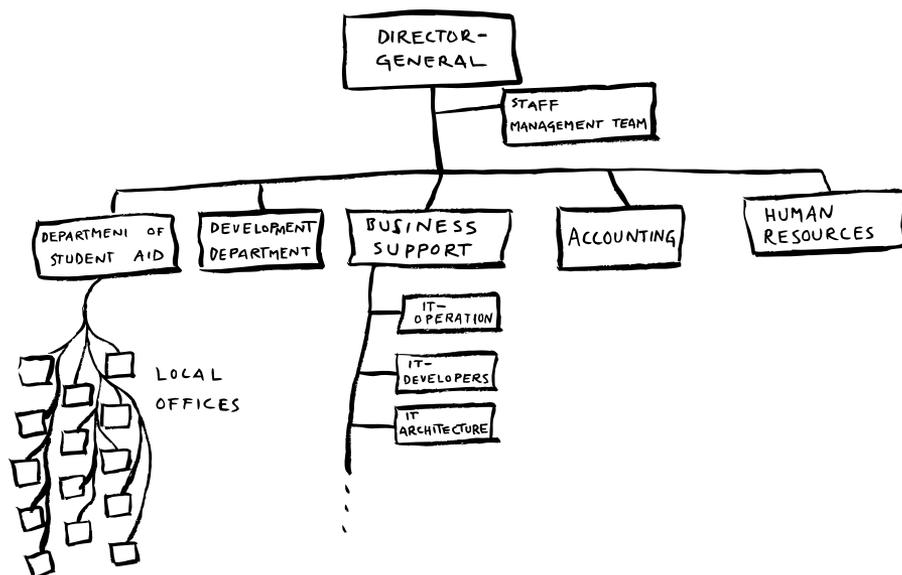


Figure 3. An organizational chart of CSN. Note the difference in hierarchy between the IT-developers and the IT Architecture department and the Development department.

with members from different departments as well as representative from the union. The over-arching aim of the project was to reduce ill-health and improve the work environment at CSN through ensuring high usability in the IT-systems used within the organization. Moreover, we as researchers had the aim of doing research and enhancing knowledge about the introduction of user-centred systems design in public authorities. More details concerning the CSN-project can be found in Paper V.

3.2 FMV and the Project

The second research project presented in this thesis was situated in the Swedish Defence Material Administration (FMV). Furthermore, the Swedish Armed Forces (SwAF) was also involved in the research.⁶ During 2009, the SwAF employed around 25,000 people [18] (including reserve officers with a civilian career) and FMV approximately 1500 people [20]. Not only were these two or-

6. In paper III, one of the cases took place within the Swedish Defence Research Agency (FOI). FOI is a research institute in the area of defence and security with a wide variety of research areas and research disciplines.

ganizations large, they were also dispersed with organizational and military units spread all over Sweden.

FMV was Sweden's oldest civil governmental agency. In principle, its main task has remained the same over time: to strengthen the operational capability of the total defence system by acquiring material in a cost-efficient way. The main customer was the SwAF, but FMV had several other customers, including the police and the coast guard. In many cases, FMV worked as a middleman between the armed forces and the system developers. The Swedish Armed Forces were one of the largest authorities within Sweden and were the only authority permitted to engage in armed combat. This meant that SwAF was the authority that carried out international missions and continues to protect the integrity of Swedish borders as well as supporting the society in major crises, for example environmental catastrophes.

There has been a huge reformation going on within the SwAF, which has been underway for several years in terms both of what kinds of warfare or services the organization should be supporting (from mostly national defence with large units to a mission-based armed force with smaller units to be used nationally and internationally) as well as what kind of soldiers they employ (going from national service to voluntary enlistment) (Viktorin 2005). All this was taking place during a declining financial situation.

The research project at FMV and the SwAF (in this thesis named the FMV-project), took place between 2009 and 2011. The commission of the research project was made from FMV. Several other research collaborations with FMV had preceded this particular project (Swartling, Dovhammar et al., 2005; Swartling 2009), but the focus of this project was somewhat different. The overarching aim of the project was to introduce a greater focus on user-centredness in the early phases of the requirement and procurement processes in the Swedish Armed Forces. In particular, the aim was to introduce, test and evaluate different user-centred methods and activities. We were two researchers involved in the project, working with a small project group at FMV. The project group had primarily a guiding and planning role.

The FMV and the SwAF were large and complex, so the project had to choose some strategic developmental projects to collaborate with, due to the limited budget of the research project. Since the aim was to introduce a higher focus on user-centredness, action research would have been a suitable methodology,

but for political reasons within the organization, it was not possible to plan and perform an action research project.

Since part of the aim was to change the procurement process, which for the most part takes place within the Swedish Armed Forces, the project set up was severely limited by the lack of representatives from this organization as well as the lack of possibilities to work openly with change. As a remedy to the lack of access to the SwAF, the project group decided that we should follow a development project at FMV and, in this situation, try to introduce usability activities and try different usability methods. The project we followed was aimed at introducing enterprise architecture (EA) within the SwAF (here referred to as the EA-project). The idea was to introduce usability in a situation where change was already underway. The EA-project would in the end affect the work processes in the early procurement process, and the overarching idea was that enterprise architecture would (eventually) replace the different requirement documents that existed at that point in time. I took part in the project meetings and other activities of the EA-project.

3.3 Introducing Usability Work

To begin at the end, did we succeed in introducing usability work in these vastly different organizations? This is not a trivial question and can only partly be answered. First of all, it is difficult to pin down the change that has occurred, and secondly there is no clear chain between cause and effect when working with change on this large scale.

At CSN there were some changes, although not all of the goals were reached, and some issues concerning user-centred systems design were not realized (paper V). Some change results can be discernible, for example, in the form of formal documentation, such as a usability policy as well as changes in business and system development models. Furthermore, usability has become something that people talk about in the organization. Moreover, the interviewees in the final evaluation interviews expressed an increase in interdepartmental cooperation as well as a heightened awareness and interest about the work situation of case-handlers by the developers. On the downside, not all methods introduced were adopted, and, for example, the important principle of iterative development was not embraced by the organization. Furthermore, there was a tendency at CSN for usability work to become synonymous with field studies, which is hindering

the full potential of usability work. When our research project ended, there were still some uncertainties regarding the role of usability professionals and their placement in the organization.

In the FMV project the change issue was more troublesome. Even though the goal was to get more usability work into FMV and the SwAF, the support for working with change was considerably less. On an individual level, we could see changes in how people talked about usability, especially in the EA-project. Unfortunately the EA-project was brought to an end earlier than planned. In sum, in relation to the key principles (Gulliksen, Göransson et al., 2003), neither the project at CSN nor the FMV-project was successful, since not all of the principles were fulfilled. However, there were changes, so these projects were not totally unsuccessful.

Why was it so difficult then, to introduce usability work in these public authorities? My research has unravelled a couple of issues that affect the introduction of usability work, which I will now elaborate on.

3.3.1 Management Support, Bottom-up or Top-down

Management support is argued to be of great importance when adopting a user-centred approach (Venturi, Troost et al., 2006), and it is clear that it was one of the caveats at FMV. The research project had strong support from management close to the project, but this support was not anchored in higher management. The research project was sanctioned and approved, but in general, within FMV and the SwAF, many activities were ongoing without the explicit endorsement from upper management. For example the EA-project was terminated prematurely.

At CSN the situation was different. In the evaluation study, “[m]any mentioned that the general manager of the public authority had been supportive, despite the fact that she was not the general manager when the project was launched” (paper V, p. 42). Furthermore, it was considered a success factor that “[t]he project had been given high priority and a sufficient amount of resources and attention required to be successful” (paper V, p. 47). Everyone did not, however, depict a positive picture of the management support: “... many also mentioned that there were other members of the management group that were not as supportive” (paper V, p. 42). Even though the management support from the general manager was clear and unambiguous, there were still problems. Consequently,

a change project needs to have support from all levels if it is to succeed, both bottom-up and top-down.

3.3.2 Starting Point of the Project

At FMV the starting point of the project could be considered a hindrance to changing the procurement and development process, due to organizational structure. The starting point was within FMV, within a research project but "... in order to introduce a higher focus on usability in the earliest phases of system development much of our attention should be directed at SwAF" (paper IV, p. 122). FMV were not allowed to change anything in the organization of the SwAF, although they could perhaps come with advice but "[t]he interaction between the organizations were settled in collaboration contracts" (paper IV, p. 122). Furthermore, the "SwAF was a very hierarchical organization" (paper IV, p. 122) and "[p]olitics was always present during the research project" (paper IV, p. 122). In general, the work with usability and user-centred design at FMV and the SwAF were severely limited by organizational factors, not the least of which was the long distance between the users in the SwAF and the development projects in the industry with FMV as a mediator in between. However, these structures will not change in any foreseeable future and, as such, must be dealt with. Perhaps a starting point in the SwAF together with higher support from upper management would have produced better results.

The starting point of the action research project at CSN did not have the same inter-organizational caveats: the entire project took place within the same organization, but still it seemed to be a hindrance to full success. The starting point for the project was the Human Resource department (HR), but during the evaluation interviews "... many of the respondents emphasised that they found it strange that a project of this size was under the control of the HR department and not of the Development department that was in charge of most projects of this size" (paper V, p. 30). In spite of the explicit support from the general manager, the project had problems, as if the organization could not make sense of the change project because of its origin in the HR department.

Sensemaking is a theory that could be of help understanding this issue. It is a theory developed within in organizational studies that explains how people make sense of their lived life. It is an ongoing, reflective activity, a process rather than a product and, according to Weick, sensemaking consists of seven properties (Weick 1995), see also figure 7:

1. Grounded in identity construction
2. Retrospective
3. Enactive of sensible environments
4. Social
5. Ongoing
6. Focused on and by extracted cues
7. Driven by plausibility rather than accuracy

All of these properties are part of sensemaking, not all of them, however, are studied or articulated in sensemaking studies. The properties can be summarized as in the following citation:

Once people begin to act (enactment), they generate tangible outcomes (cues) in some context (social), and this helps them discover (retrospect) what is occurring (ongoing), what needs to be explained (plausibility), and what should be done next (identity enhancement). (Weick 1995, p. 55)

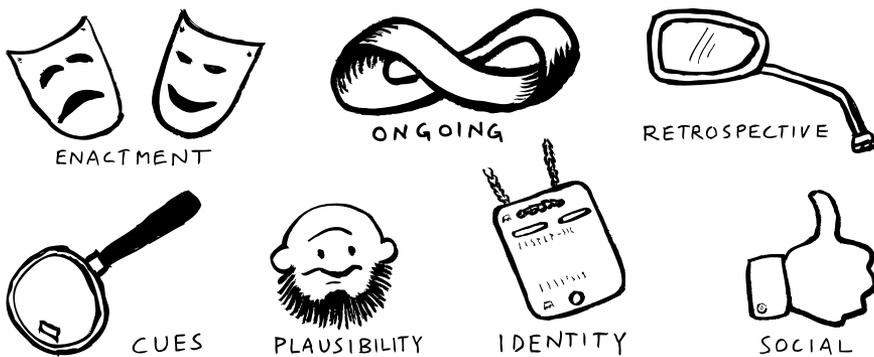


Figure 4. The seven properties of sensemaking illustrated.

Sense making seems to happen all the time, and is not always easy to study: mostly it is so effortless that it is only the result that can be noticed. However, it is easier to study sense making where there are expectations and divergences from these expectations, and where there is a need to comprehend a situation or event. The start of a major change project from the HR department could be such a situation. In the social context of CSN, it was more plausible that a change project would start from the Development department, and, when it was

not, it was considered to be of minor importance. The Development department (and other parts of the organization) acting on this sense making, by not actively taking part in the project, strengthened this meaning. The sensemaking at this level could be described as being intersubjective.

The concept intersubjectivity derives from a paper by Wiley (1988), where the author defines four levels of micro- and macro-sociology; intrasubjective, intersubjective, generic subjectivity and extrasubjective, where intrasubjective and intersubjective belong to the micro-level and generic subjectivity and extrasubjective to the macro-level (Wiley 1988), see figure 5.

These micro- and macro-levels can become a vocabulary to describe and understand sensemaking as well as other phenomena in organizations. Explained in terms sensemaking, intrasubjective is the personal level, the “I” that makes sense of a given situation. The next level, intersubjective, is the interaction between individuals, and in a sensemaking perspective, the meaning concerns a “we” instead of the “I”. Both Weick (1995) and Wiley (1988) talk about a transformation from the self to a merged subject of two or more subjects that occurs on this level when individuals interact, communicate and share meaning. Generic subjectivity is a level of social structure, where subjects are interchangeable; this level consists of the scripts, role descriptions, methods and models, both formal and informal within organizations. A subject is still present on the generic subjectivity level, although as an abstract subject. The fourth level, extrasubjective, is described as the cultural level, defined by Wiley as a “... subjectless level of symbolic reality ...” (Wiley 1988, p. 259).

The Development department was responsible for developing the core processes and routines at CSN, thereby working with creating or changing the generic subjectivity. This was not a role that the HR department, where the project was situated, usually had. The responsibility of the department where the project started (cues) led to an intra- and inter-subjective sensemaking that the project did not concern the whole organization. However, although this placement was troublesome, “... many also said that it might have been necessary, since the project might not have happened if it had not been for the initiative from the HR department” (paper V, p. 30).

The situation at the FMV-project, with the starting point and the organizational structures that hindered the change work, also has an interesting sensemaking perspective. The aim for our research project was clearly to introduce user-cen-

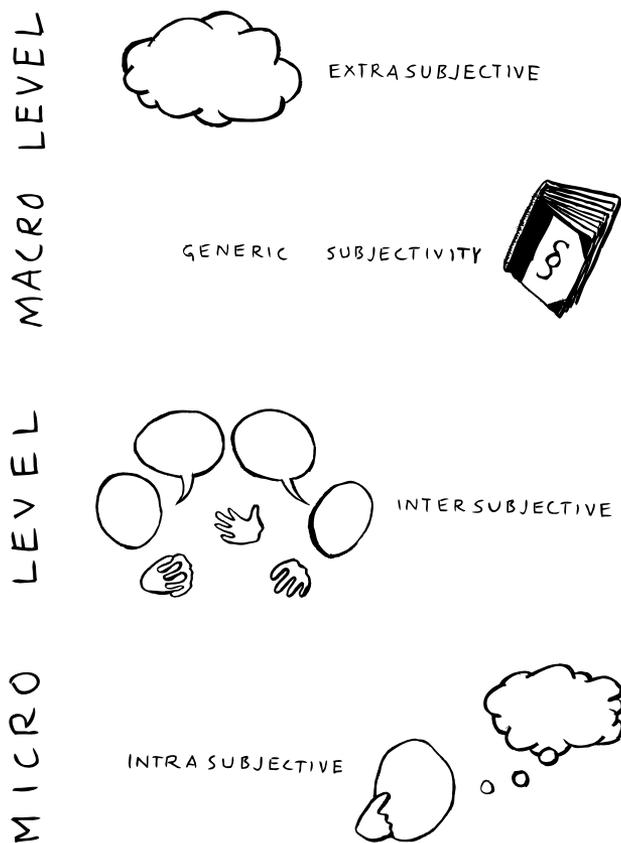


Figure 5. The micro- and macro-levels of sociology.

tred design into the procurement process, a new approach for the organization. And yet we were not allowed to make any changes. This fundamental divergence between goal and organizational possibilities were not acknowledged by FMV. One interpretation of this was that they had not yet made any sense of user-centred design and the actual change that it necessitates. The starting point in FMV could also have acted as a cue for stakeholders in the SwAF to not engage fully in this project, since FMV could not instigate change within the SwAF.

In either case, the sensemaking of the starting point of the project affected the possibility for the project to work effectively. In order to successfully implement usability work in organizations or introduce changes in their processes, there is a need to explore and probe the sensemaking processes in these situations. This

could give us a better understanding of how to enter the change setting and choose an approach appropriate for the context.

3.3.3 Reluctance to Change

Reluctance to change was present in both research projects, though with slightly different origins. At FMV and the SwAF there had been a change process going on for several years (Viktorin 2005). Furthermore, the changes had been accompanied by a declining financial situation, further exerting pressure on all involved. Moreover, the career track in the SwAF encourages people to change positions often, sometimes as often as every one and a half years. This had led to situations where “[e]very time a new person came into higher management they wanted to make their own impression and therefore instigated more or less organizational changes” (paper IV, p. 121). This ongoing changing context opened up for possibilities for introducing user-centred design. However, the same context “... also put a strain on all the involved personnel, leading to a disinterest in yet another thing to learn and incorporate in their everyday work practice” (paper IV, p. 121).

At CSN, interviewees in the evaluation interviews expressed that “... if the [D]evelopment department would have engaged earlier in the project, the effects on the end results could have been a lot bigger” (paper V, p. 48). The Development department was passive at the beginning of the project, although they had a presence in the action research project team. The argumentation was that “... they already worked in a user-centred fashion and that the [CSN-project] therefore could not contribute that much” (paper V, p. 48). Even though the participation and engagement from the development department did increase, “[o]ne of the pitfalls of the project was the inability to motivate the [D]evelopment department to actively engage in the work” (paper V, p. 48).

The reluctance to change in these two situations is different. In the FMV-project, the fatigue was difficult to work with, since it already existed there when the project started. One interpretation of the situation would be that the needs of the organization at that given point of time were to find some stability before yet another change project started. The FMV-project did not develop so far that a organizational change process started, but there are reasons to believe that the change fatigue would have severely hindered the process. At CSN on the other hand, the reluctance to change gradually decreased during the project. As stated above, the placement of the project affected the sense making, and the

Development department did not engage fully. This was altered when a new subproject manager was appointed by the Development department and possibly through the usability coaching which will be described and discussed below.

3.3.4 From Organization-wide to Organizational Change

From the beginning, there was a focus on involving the entire organization in the action research project at CSN. This was not an explicit part of the UCSD key principles but was later found to be important when introducing user-centred design (Cajander 2010). The action research project group consisted of members from all major departments at CSN, such as IT Architecture department, the Development department, Human Resources as well as representatives from the union. Despite this, and despite efforts to do many activities at the local offices, the project featured "... a strong focus on the head office, where the research group has spent most of their time. This [had] the negative consequence that some of the local offices [felt] that they [had] not been involved sufficiently" (paper V, p. 49-50). Furthermore, there were activities launched in order to achieve the engagement of the whole organization; an example of this is the information campaign. Results from the evaluation interviews show that "... the information activities were good to start with, but that they did not live up to the expectations later on in the project" (paper V, p. 40). Furthermore, "[m]anagers may have been informed about the project but failed to forward that information further down into the organization" (paper V, p. 40). Not only did the information fail to reach all stakeholders in the organization, but "[t]he feedback given on the information also shows that it tended to use abbreviations and computer-related terminology that was difficult for the readers to relate to" (paper V, p. 40). All local offices were visited during the project and information was sent to all managers as well as published on the intranet, but clearly the information process could have been improved further. Foremost, the information process could have been evaluated and developed iteratively, in accordance with how we argue that system development should be carried out; as such, it would have become a more reflexive process. This later became part of our guerrilla tactics at FMV, to introduce UCD with UCD (paper IV). In this approach, we applied the key concern in user-centred design, focusing on and involving the users (of user-centred methods) in our change effort. Consequently, at CSN, the information could have been further developed, if we had considered the readers as users of the information. Here methods to understand the users' needs could have informed the formation of the information and through this prevented the usage of overly technical language.

It should be noted that the involvement of the whole organization could be viewed as one dimension of the organization. Turning to the micro- and macro-levels of social life (Wiley 1988), these could be viewed as a second dimension intersecting the first. Considering these micro- and macro-levels, not all of them were addressed in the change effort. The information campaign affected the micro-level, with an emphasis on the intrasubjective, and as such it was a passive process of informing, but not really engaging the individuals in active sensemaking. Perhaps this was due to the limited view of the project. However, half-way through the project an interview study was conducted with managers at CSN, where they were asked about basic values and perspectives on usability and work environment (Cajander, Gulliksen et al., 2006). The results were presented several times in the organization and raised awareness that the CSN project was not only a technology-oriented project, aiming at changing the practice in the IT development process, but rather encompassed changes throughout the whole organization. If this was an organizational change project, how could this be done?

An initial question would be, if these public authorities could be considered organizations in the first place. Brunsson and Sahlin-Andersson argue that organizations are socially constructed, and how public sector reforms have changed what earlier could be called agents or arenas into more “complete” organizations (Brunsson and Sahlin-Andersson 2000). Consequently, the public authorities I have worked with can be theorized as organizations.

Turning to organizational theory, one prevalent view regarding organizations is that organizations are stable, and that change occurs when a force is destabilizing the organization, and then it can be stabilized again (Grey 2005). With this perspective, change management needs strategies to handle for example resistance from the people subject to change (Kotter and Schlesinger 1979). Implicitly, this view describes people as objects that can be managed into changing and fails to include that people are subjects that can react in different ways than intended, which might lead the change into an unpredicted direction (Grey 2005). Although compelling, this perspective does not really comply with my point-of-view as a social constructionist. Instead another stream of organizational theory caught my attention, one where organizations are not viewed as intrinsically stable. Tsoukas and Chia (2002) promote a view of organizations as in constant flux and that action comes first and organization is an outcome of action. Here people become active subjects in creating the organization.

Furthermore, Tsoukas and Chia describe how organizations are a set of routines and rules, which are socially constructed, to order the action of individuals.

Routines and rules are the very base of the organizations I have been collaborating with: they are playing a central role at both CSN and FMV and account for the generic subjectivity in organizational life. In the FMV-project, one strategy to get usability issues into the development process was to include it in the set of rules for the enterprise architecture that was supposed to be implemented in the future. There are no results from this effort since the EA-project was prematurely terminated.

At CSN "... several of the development models have been rewritten and further developed and new models have been introduced" (paper V, p. 47). However, in the evaluation interviews "... few mention that they have seen any changes in the systems development processes at all" (paper V, p. 38), and "[o]thers know that changes have happened and trust that the changes made are improvements, even though they do not know any details of the changes" (paper V, p. 38). This gives a contradictory picture: the importance of these changes is recognized, but when individuals are asked about the concrete changes, they do not know what they are. How can these changes in the development models change what people are doing, if they do not know them? What is clear here is that changes have been made on a macro-level, at the level of generic subjectivity. However, there has not been any change, or sensemaking in the extrasubjective level, the culture of the organization, or the micro-, individual and interactional levels. Organizational change should not only encompass all departments and units of the organization, it must also affect all levels of subjectivity.

Another formal document, the usability policy (paper V p. 36), was promoted as one of the most important results from the CSN-project. The policy was developed as a collaboration between researchers and the usability professionals at CSN and has gone through an extensive review process within the organization, which also included representatives from the union. The policy was based on the key principles for user-centred systems design (Gulliksen, Göransson et al., 2003), but going through the review process the principles were adopted and tailored to the context of CSN. In the evaluation interviews, "[m]any mention the usability policy as the door opener giving usability issues a legitimacy showing the importance to everyone involved in all forms of development" (paper V, p. 36), and "[p]articularly in relation to the overall management of the organization it has been important to use the policy to show that these issues are

of key concern” (paper V, p. 36). However, “[o]thers explain that CSN already [has] a great number of policies and therefore it is difficult to see its effect at all” (paper V, p. 36). Furthermore, in the evaluation interviews, the organizational belonging of the policy was mentioned, the ownership was placed in the IT Architecture department, but many believed it should have better been situated in the Development department, since this is the department that has ownership of policies of the same kind.

The usability policy is interesting, since it is, by its definition, an organizational-wide policy, and yet the meaning of the policy is contested. There is something important here, something about how people made sense of this usability policy. The long process of establishing the usability policy has been criticized, but perhaps the long writing process was necessary, and the “... large impact was due to the actual process of writing the policy w[h]ere many different parts of the organisation were involved and engaged rather than the policy document as such” (Paper V, p. 47). This could be attributed to it being a sensemaking process; by writing the usability policy, a tangible artefact was enacted as, a cue to make sense of. The long process of reviewing also became a reflexive process where different perspectives and viewpoints could be collected and made sense of. Furthermore, the policy instigated change on the generic subjective level, a macro-change, but the long review process also created sensemaking and a change on the inter- and intrasubjective levels. Moreover, the involvement of many stakeholders in the process placed it in a social context, where many could be involved in the understanding of it; it became grounded in the organization. Here the two dimensions, the organization-wide, and the organization-deep met, which could become the fundament of a sustainable change. Later, the ownership of the policy, as being a part of the IT Architecture department, then became a new cue to use in the sense making of the policy. The other organization-wide policies were situated in the Development department (in the hierarchical organizational structure higher up than the IT Architecture department), and since the usability policy was not included there, it could not be concerning the whole organization.

Apparently it is not enough to just change the formal structures: the generic subjectivity enacted by the documents in repositories telling the people in the organizations what they are supposed to do. There is also a need for addressing the micro-levels; the sensemaking of usability on an inter- and intrasubjective level.

3.3.5 Importance and Caveats of Pilot Projects

At both FMV and CSN, the project groups felt a need to demonstrate to the organization what usability work could be, and the idea was to do this through pilot projects. This was also a way to assess which methods or activities would fit the context. This could be interpreted as an attempt by the project groups to direct the individuals' sensemaking of usability work. Facilitation of sensemaking is defined as sensegiving by Gioia and Chittipeddi:

“Sensegiving”, is concerned with the process of attempting to influence the sensemaking and meaning construction of others towards a preferred redefinition of organizational reality. (Gioia and Chittipeddi 1991, p. 442)

Even though it makes sense that there is a possibility to influence the sensemaking process of other individuals, it is also very precarious, since the process is highly individual and internal. Sensegiving suggests that it is possible to change or generate new cues that individuals use in their sense making. However, there is no certainty that individuals will react to these cues; there could be others that call for their attention.

The attempt to use pilot projects to show what usability work could be, seemed like a good idea in planning, but it was much harder to realize in practice. At CSN “... it has been difficult to find an appropriate pilot project, and the pilot projects that have been started have been aborted” (paper V, p. 49). Some of the difficulties related to project budgets and the fact that the usability activities ended up as a sidetrack to the already planned activities in the project. Finding a large project in the right stage of planning for including usability activities was hard, and instead several smaller projects were targeted. However, this had the implication that the impact became far less than anticipated. One example of a positive local impact is the intranet pilot project (paper V, p. 45), where developers stated after the project that they had become inspired to work with prototypes.

At FMV, only one project was targeted as a pilot; it was, however, large and encompassed plans to change large parts of the procurement and development process at the SwAF by introducing enterprise architecture. However, there were several dilemmas attributed to this. One was the clear division between research project and pilot project where “[t]he deliverables in the two projects did not always overlap, and financially the research project had precedence” (paper IV, p.

123). Furthermore when the EA-project fell out of grace, almost all the efforts invested in this pilot project were lost.

In summary, in neither of the public authorities did the pilot projects turn out to be a success. It did not work as a sensegiving opportunity, and the outcomes from the pilot projects were small. Pilot projects could even play a directly negative role in the sense making of user-centred design and usability work. If the user-centred design activities did not contribute to the end result, the pilot project and the activities in it could be picked up as cues to disregard usability work.

The pilot projects were supposed to be a proof-of-concept for the methods and activities the field of HCI has developed. One way of conceptually making sense of methods is by using a theoretical lens of knowledge theory. From one perspective the methods and activities constitute knowledge, but, at the same time, the methods and activities will lead to something, which perhaps is knowledge. So, turning to knowledge in organizations, what is it? Davenport and Prusak define knowledge as:

... a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms. (Davenport and Prusak 1998, p. 5)

There is something elusive in this definition; it is something that can be embedded and applied, and, even though it is not tangible, it seems to be almost a thing. With the view of knowledge as a thing, one stream in knowledge management has been studying how to manage knowledge as a resource: in a sense to capture it, codify it and transfer it. The pilot projects at CSN and FMV fit in this perspective, a situation where the coded knowledge of how to do usability work could be applied. However, there is criticism directed at this somewhat functionalist view of knowledge as a resource. Styhre argues that knowledge instead should be seen as a combination of practice and concept and that knowledge is inherently social in its construction (Styhre 2003). Furthermore, for example Snowden argues that knowledge is not only a thing, but also a flow (Snowden 2002), and Blackler argues that we should not study knowledge as something we have (a thing) but rather something we do (knowing), and that knowing is “mediated, situated, provisional, pragmatic and contested” (Blackler 1995, p. 1040).

In hindsight, these pilot projects did not focus on knowing, but rather they were a situation where usability knowledge, in the form of methods and activities, was applied in an already ongoing project. In order to be successful, user-centred actions in pilot projects need to be a part of the project plan and not an activity on the side of the core processes in the project. However, pilot projects are a way of situating the change process in a real context, and, as such, could be important. Furthermore, they could support changes on an inter- and intrasubjective level and could thus work as small steps of changing the organization, one project at the time. I still have a lingering feeling that I do not see the whole picture here.

3.4 This is All Very Well, But...

I have above argued that the whole organization needs to be involved when trying to introduce usability work in organizations, an argument that is in line with Bjerknæs and Bratteteig (1995) who describes a historical development of Scandinavian system development research projects. Projects in this development have gone from organizations as a whole but with a focus on institutions, through a focus on particular interest groups, back to the whole organization, but with a focus on the situated actions of system development. A similar argument can be found in a paper by Svanæs and Gulliksen (2008), where they argue that it is important to take into consideration the context of design when starting a development project. However, this is not enough, when the development project aims at getting more user-centred design into an organization. I argue, in the same vein as Mayhew, that anyone wanting to introduce usability work must act as an agent of organizational change (Mayhew 1999). Hence understanding organizational change is imperative, and sensemaking is one analytical tool in this endeavour.

Although the whole organization is involved, an organization-wide approach, there is a need to acknowledge the depth of the problem. When promoting organizational change, we need to address several levels of subjectivity, both micro- and macro-levels. In the change projects described above, there were attempts to alter how the organization worked with technological development through transmogrification of the formal routines and processes, a change on the macro-, generic subjectivity level. This was done, for example, through alterations of the development models at CSN. However, this was not enough, neither the people at CSN nor the people at FMV began working differently

due to these changes. Furthermore, both change projects tried to give sense to the organization of what usability work could be through pilot projects, but this was also not enough. Some changes were seen, on the micro-plane, in the sensemaking on an intrasubjective and intersubjective level. The work with the usability policy at CSN was the approach that invoked sensemaking and change on both a micro- and macro-level, the document in itself being on the generic subjectivity level, and the writing and reviewing of the document acted as a reflective sensemaking process on the intra- and intersubjective level. But still, the merit of the policy was fragile, and the placement of the responsibility of the policy affected the sensemaking of it negatively. As such, the usability policy was an approach that was both organization-wide (with reviewers from several different departments) and organization-deep (affecting several levels of micro- and macro-), but still it was not enough. I get the feeling that there is something missing. We are trying to change these organizations, but what is it that we are actually trying to change? Could I use another perspective to get a better understanding on what is going on?

3.5 What Practice... Our Practice?

The word practice is widely used in research literature; sometimes it bears a deliberate meaning and sometimes it just holds the mundane role of portraying ordinary work in general. Some connect the term to professionals, for example Schön who advocates for more attention to practice and practitioners' knowledge-in-action (Schön 1983). He presents several practitioner voices in his book, for example, architect, manager, town-planner, and psychotherapist. Practice is here closely tied to a profession of some kind, as opposed to the usage of the term in "practice of lived life", used by for example Suchman (Suchman 2007).

Feldman and Orlikowski elaborate on practice theory in organizational studies, and at its core is "the notion that social life is an ongoing production and thus emerges through people's recurrent actions" (Feldman and Orlikowski 2011, p. 1240). Furthermore, action is situated, deeply embedded in the context in which it takes place, and cannot be planned and anticipated in detail beforehand. According to Suchman:

... coherence of action is not adequately explained by either preconceived cognitive schema or institutionalized norms. Rather the organization of situated action is an emergent property of moment-by-moment interac-

tions between actors, and between actors and the environments of their actions. (Suchman 1987, p. 179)

Consequently, what people do at work is practice; it is made up of the doings. But when we enter the public authority, whose doings should we impart? Our own?

Who are we, the ones trying to disseminate usability work into these organizations? In the context of this thesis, we⁷ are researchers, my colleagues at Uppsala University and KTH and I, but it could equally be any researcher trying to work with change in organizations. What we are and what we do is constituted by the recurring action of doing research. Being a researcher means doing empirical work, analysis, writing, publishing, attending conferences, lecturing and writing grant applications, to name a few the activities we engage in. Some research projects require us to take a role of a designer (Lantz, Räsänen et al., 2006) or usability professional, using the usability methods and activities that we also are trying impart. However, these methods and activities are not at the core of our practice. If they would be, we would be consultants rather than researchers. Consequently, even though we might engage in usability work when doing research in organizations, it is not our practice we are trying to convey to the organizations. Instead it should be the practice of doing user-centered design, the practice of usability work. Is this new practice, or does it exist somewhere?

Usability practice does exist; there are organizations that, according to surveys, work (more or less) in a user-centred manner (Mao, Vredenburg et al., 2005; Venturi, Troost et al., 2006). At CSN there was already a usability professional when we entered the organization and one more was hired during the project. However, the role of the usability professional was debated within the organization (paper V, p. 38). At FMV there was a few usability professionals, but they could not participate in projects or efficiently work with usability strategically (paper IV, p. 121). Hence, the practice of usability work was not firmly established in these organizations.

What we have been trying to introduce: has that been usability practice? But backtracking to the definition of practice, it is constituted of recurrent situated actions. Consequently, the practice in the study by Venturi et al., is not the same

7. We could, instead of researchers, be usability professionals trying to establish user-centred work in organizations. Some of my results here would apply for them as well, for example the need to act as a change agent and being aware of the organizational change aspects.

as the practice in the study by Mao et al., since they are not part of the same context. Furthermore, practice is not a thing. Practice is not method descriptions, processes modelled in boxes and arrows or policies. Practice is situated action, and as such it is not something we can carry with us and bring into another organization. *With this conclusion I can only say that if by usability work we mean practice, the actual doings, we cannot introduce it into organizations.* It is not ours to give from the start, and we cannot take it with us from one setting into the next. There is actually no it. The very concept of introducing, bearing connotations of bringing things into the organizations and believing it will make a difference will not work, when what actually is needed is organizational change. No wonder there were so many hindrances for a successful introduction of user-centred design in the organizations I have worked with. But what should we do then, how can we get user-centred design into these organizations?

4 Situated Reflexive Change

Life has never been All or Nothing- it's All and Nothing. Forget the binaries.

(Jeanette Winterson, The Stone Gods)

Policies, processes, routines, models and methods: it seems to be such an ordered world in organizations. Different departments have the responsibility for different functions, and there is a hierarchy to things. In the enterprise architecture world at FMV, for example, it is (said to be) possible to model the whole defence enterprise with a few building blocks of UML diagrams⁸. And yet it was so difficult to change these organizations. Even in the CSN case, where usability and user-centred design (albeit slightly changed with reference to the key principles) were inscribed in the formal documents of the organizations, the change was hard won.

Politics, sensemaking, people, it seems to be such a complex reality out there in the organizations. Developers that had not read the system development model for years still carried out their work. The pilot projects were falling out of grace, and words for some reason were taboo. Whatever worked in one context seemed to be impossible in the next. Struggling with these two types of reality and trying to address them individually I finally give in. At last, I feel that I can cut the Gordian knot of organizational life: the dualism of ordering and action is not a dualism. It is a duality. The world out there is both ordered and complex. We need to be prepared for this and adopt an approach when doing research with the aim of enhancing or promoting usability work in organizations that can handle both order and complexity.

Feldman and Orlikowski present three central principles in practice theory: “1) that situated actions are consequential in the production of social life; 2) that dualisms are rejected as a way of theorizing; and 3) that relationships of mutual constitution are important” (Feldman and Orlikowski 2011, p. 1243). These three principles are intertwined and implicate each other, which implies that they cannot really be separated. The first principle implies that we need to focus on

8. The actual framework for this is MODAF (Ministry of Defence Architecture Framework), but the particular views are modelled in UML (unified modelling language).

the everyday situated actions, since this is what constitutes practice. In my case, this would mean the usability work out there in the organizations is made up of what people are doing. Pilot projects could then be a way establishing new practice, but it needs to be a reflexive, iterative process to make sense in this particular context. But it also means that if we want a sustainable change, it cannot be us, the researchers that do these situated actions. We are only engaged in time-limited projects, and the recurrent actions must continue after we have left the scene. In addition, this also has implications for organizations commissioning consultants. The consultants are engaged for a limited time frame, and when they leave the organization, efforts must be made to retain the knowledge and knowing they constructed. Consequently, there is a difference if a change effort is undertaken with staff from the organization or with consultants from outside the organization. The second principle entails that a practice theorist should be sceptical regarding dichotomies and, instead of dualism, embrace duality. We need to see the order and the complexity in these organizations, face both sides of the coin and have strategies for both order and complexity. The third principle says that phenomena are produced through mutual constitution by other phenomena and are through this process relating to each other. Feldman and Orlikowski illustrate it in the following quote:

The notion of mutual constitution implies that social orders (structures, institutions, routines, etc.) cannot be conceived without understanding the role of agency in producing them, and similarly, agency cannot be understood “simply” as human action, but rather must be understood as always already configured by structural conditions. (Feldman and Orlikowski 2011, p. 1245)

The third principle directs us at changing both the structures and the recurrent actions. This is in line what other scholars within the HCI field are exploring: for example, Dourish when he requests us to reconsider the representational view of context, and instead embrace context as mutually constituted with action (Dourish 2004). Ignoring one side of the coin will likely cost us.

I argue that the approach we need to adopt in order to get user-centred design into organizations is *situated reflexive change*. The approach need to be situated because we are trying to change the situated recurrent actions of development practice; situated also implies collaboration, since there must be organizational actors who can engage in the situated recurrent actions. The approach needs to be reflexive, because it is only through reflexivity and an iterative approach that we will be able to probe into the complex organizational life and unknown fu-

ture. Furthermore, the reflexivity also helps us to include ourselves, as researchers, in the process. Lastly, the approach concerns change because we can no longer talk about introduction (even though the word easily escapes my mouth): we need to strive for organizational change in order for usability work and user-centred design to permeate practice and be sustained. Our role would become change agents, promoting a reflexive change process.

4.1 What We Bring

I have been talking about usability methods and activities as a research result that could be used in practice. However, situatedness implies that it is not possible to ignore either the context or the people involved, which further implies that, if we are to develop methods, these methods are contingent on the situation in which they will be used and by the users of the method and the very usage of the method. Or in Suchman's own words about instructions (which could also hold for methods): "... instructions do not precede the work of their enactment but rather their sense is found in and through, and only in and through, that work" (Suchman 2007, p. 22). Orlikowski (2002), has argued that practice cannot be moved, and instead on focusing on how to transfer methods, we should focus on how to enhance individuals capability to enact new practice. This makes research on methods difficult, because the methods become inherently slippery as a concept, and the idea that we can create a method that should be replicated in other situations is troublesome, since we can never know the full extent of the situation in which the method will be enacted. But a first step is to be more articulate and perhaps critical in describing the situation where a method has been used or the situation where a method could be used.

The Cynefin framework (Snowden 2002; Kurtz and Snowden 2003) originally developed as a sensemaking⁹ framework within knowledge management gives me a handhold, a way diversifying where or how our HCI methods could be used. The Cynefin framework consists of the three domains: order, unordered and disorder. Furthermore, the order/unordered domains are divided into two subdomains each – in the ordered domain, known and knowable and in the unordered domain, complex and chaotic, see figure 6.

9. I write sensemaking here as one word; in the paper of Kurtz and Snowden, it is written as sense-making.

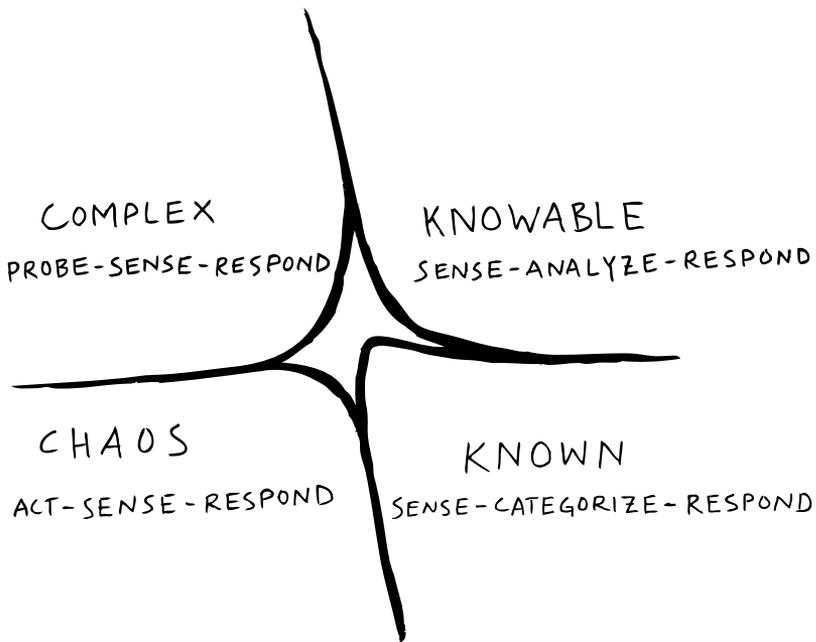


Figure 6. The five domains of the Cynefin framework, to the left the unordered domains of complexity and chaos, to the right the ordered domains of known and knowable, and in the middle, the domain of disorder

The usage of the word unordered is explained as “conveying a paradox, connoting two things that are different but in another sense the same” (Kurtz and Snowden 2003, p. 465) and refers to the usage of the prefix by Bram Stoker in his word undead, which is a being that is neither alive or dead. Unorder thus means there is a different kind of order but one that we cannot perceive directly.

The first domain is the ordered and known domain. This is the domain of visible order: cause and effect are easily discernible (Snowden 2005). This is a domain where best practice is applicable and where the decision model is to sense what is needed, categorize the information you gain and respond according to previously decided practice (Kurtz and Snowden 2003). Important to note here is that this domain is sometimes called simple, which can be misleading. It is not necessarily the simple situations that are in this domain, just that the patterns are easy to follow, and there is knowledge to take action in this domain, but the action taken might be complicated. Many of the HCI methods could be applicable in this domain; for example heuristics, design guidelines and Fitt’s Law (Preece,

Rogers et al., 2002). But not all situations are so ordered that these ordered devices work.

This takes us to the ordered knowable domain, the domain of good practice and hidden order, where experts (or time and resources) are needed to understand a situation (Snowden 2005). This is a domain where the cost of understanding a situation is very high. Somebody could know the answer to the questions, and the decision model is to sense then analyse the information and act on the results of the analysis (Kurtz and Snowden 2003). It would be tempting to put requirement analysis in this domain. And perhaps we want requirements to fit here. It would be neat and comfortable, if we only spent enough time, we would be able to get it all right the first time around. However, instead, many of the real world situations we are trying to support with computer tools belong to the complex domain of human lived life.

The unordered, complex domain is the domain where patterns are not perceptible immediately, although they usually can be seen in hindsight. The decision model is to probe first, since there is no order to sense, and then sense the results of the probing to see if there is any emergent pattern and lastly to respond (Snowden 2002). The inspiration of this domain is complexity theory, where the patterns emerge through actions taken by many agents (Kurtz and Snowden 2003). Sometimes it is not only possible to disrupt or stabilize patterns but actually seed the situation with things that will make desirable patterns to emerge (Snowden 2002). Prototyping is a probing tool consistent with this domain (Preece, Rogers et al., 2002) as a way of trying out possible ways of interacting in an unknown space.

In the fourth domain, the unordered chaotic domain, there is no cause and effect, and, even retrospectively, there seem to be no patterns to follow (Snowden 2005). The only thing one can do in the chaotic domain is to act in order to get out of the domain whether by imposing order or do something that might make patterns evolve (Snowden 2005).

The fifth and last domain is situated in the middle, the domain of disorder. This is a situation where people have not yet made sense of a phenomenon and where there is no consensus of where it could belong. What is important to know about the domain of disorder is that, when situated in a situation in the disordered domain, people tend to fall back on the action model in the domain where they feel the most at home (Kurtz and Snowden 2003). They use

the patterns of action that they feel the most comfortable with. Trying to use knowledge, that is routines, scripts or other ordering devices, in the complex or chaotic subdomains can, however, be troublesome, and even lead to a more severe situation than it was from the beginning

There are several aspects of this framework that are important to clarify, since it is a sensemaking framework rather than a categorization framework. First of all, the domains are not quadrants, where there is preferable state (Kurtz and Snowden 2003, p. 465). These domains are just something that are, and the purpose of delineating them is to elicit the differences in possible action. Furthermore, order and unordered is not supposed to be seen as a dichotomy; they are in real life intertwined and interacting (Kurtz and Snowden 2003). Lastly, I would like to emphasize that, as a sensemaking framework, it is inherently subjective. Different people will make different sense of a situation or phenomenon, and the strength of the framework becomes most apparent in situations where people try to collectively make sense of something. Hence two individuals in the same situation could make sense of the situation differently, where one finds order, the other only sees unordered.

Reflecting on what kind of domain HCI methods belong to and what kind of knowledge the methods encompasses can give us a better understanding in which situations they could be applicable in the organizations we are collaborating with. It could also help other researchers to assess the methods we develop in a more informed manner. Moreover, I propose that we should consider whether a method is used as an instance of usability work or a change initiative. These two perspectives are not necessarily mutually exclusive, but considering methods in these two perspectives can elucidate more of the nature and the merits of the method. By an instance of usability work, I mean something that could become a part of a usability practice in organizations. In a sense, it is a test of using one of the methods in a given situation, with a given set of users of the method. A change initiative, on the other hand, is mainly used as promoting or motivating change.

Not only do we need to address the situation in which a method will be used, or could be used, we also need to consider the user of the method. The user here denotes the particular user of the method in the research setting or the presumed future user. In many cases, the presumed future user is a usability professional or interaction designer. The concept of a role like the usability professional might seem clear, but can in fact be enacted differently with different

preferred methodologies and perspectives on users depending on educational background as shown by Clemmensen (2004). However, being more explicit will help others to judge the applicability of the method.

Why do I need to make these distinctions and elaborations? Many of the usability methods developed in the research field of HCI are widely used in practice, persona being one example. However, my experience is that not all of the methods we have developed are used, and sometimes they do not seem to fit the practice that is out there right now. Some answers to this problem might be that we are trying to introduce them instead of focusing on the change effort. Another explanation often heard is that the practice is to blame, that it is not mature enough. However, I would argue that there might be a problem of our understanding of the methods themselves and their applicability. Using the theories I have introduced in this thesis as a framework for getting a better understanding of the usability methods can help us (the researchers of HCI) to be more relevant for practice.

Accepting situated reflexive change as a premise does not mean the end of methods; it just means we have to grapple with a new understanding of methods. They are not something you can just apply with the same results in all situations, especially not in the unordered domain of complex or chaotic situations. Usability methods are still important in conveying a way of doing things in order to understand the world, in creating, in knowing.

4.2 System Developers Doing Field Studies

One of the actions planned by the project group in the CSN-project was to offer a course on usability to the system developers at CSN, this action is described in paper I. The aim was to give them a better understanding of usability, some new tools in their development work and better understanding of what a usability professional could contribute with. The researchers were asked to plan and execute the course, and there were negotiations on the length and scope. In the end, it became a two-day course with an intermediate day of doing a field study. There were 40 developers participating in the course, mainly system developers, but a few with other roles, for example, system specialists, technology development leaders and web designers. The first day lectures concerned the basics of human-computer interaction and usability as well as instructions on how they could do field studies, with a focus on the practical work of doing interviews

and observations. After this, the developers did the field studies, including planning and writing a field study report. During the second day of the education, the field study experience was discussed after which there were a lecture on design and prototyping.

This education turned out to be an interesting situation for research, since we had not read or heard of a similar situation: more than 40 developers who for the first time did field studies into the work practice of their users. We tried to get hold of a range of different material around this course: the field study reports of the developers, interviews with three developers, a survey sent out to the participants where they were asked about their experience as well as the results of the standardized survey the organization always did to evaluate their courses (for details see paper I). The situation was somewhat artificial; they did the field studies as a part of a usability education and not in conjunction with a project. As a remedy to this, I was able to interview two developers who actually did field studies in a development project, a pilot for usability methods.

The main results reported in the paper is the experience from the perspective of the developers, where they seemed to have gotten a better understanding of the holistic picture, what their development would lead to and the place in the system development process where they belonged. It was evident that they lacked HCI knowledge; for example, through their field study reports we could read of usability problems, which they did not seem to understand, were problems. However, field studies did not seem to be wasteful, since the developers were highly motivated by them, and the experience could also help knowledge transfer in the sense that they would have a better understanding of the information that the usability professional would convey after having done a field study. The developers also seemed to make informal contacts with the users, which they could be using in later development. In addition, it is important to note that the role of the usability professional did not become redundant with this activity: the expertise was still needed to notice and analyse usability related issues.

The field study method, in this context, was tried as an activity in the practice of the system developers, where they did field studies into the practice of the end-users. As such, it can be seen as a change initiative, that is, a way of showing the systems developers one aspect of usability work as well as an instance of usability work in itself. There was a possibility that system developers doing field studies could become a part of the system development model and, hence, become a part of the usability work at CSN.

Many of the developers had never been into the work place of the users or even met users, although they had been working with development in the organization for a long time. The respondents I had talked to expressed that they had a good understanding of the rules, regulations and routines surrounding the case-handling, they had the knowledge concerning this, and from their point of view the practice of the case-handlers were ordered and known. However, work was situated and not easily captured in ordering devices, and the practice the system developers visited did not correspond one-to-one with the rules and regulations. In this respect, from the point-of-view of the system developers, the practice of the case-handlers became harder to grasp, it became knowable or perhaps even complex according to the Cynefin domains. Furthermore, they lacked competence or knowledge regarding how to notice usability problems in the situation they were visiting. The field studies could be seen as a probe into this complex situation, giving the developers an opportunity to gain an understanding of the situation and a knowing thereof, on a more holistic level. The usability professional is still needed to do more advanced analysis of the work practice of the case-handler, but the situatedness of the work is hard to capture, codify and transfer. This is where the field studies that the system developers did could be beneficial, since they then had a sense of what was going on out there and could more easily make sense of the information the usability professional provided them. Furthermore, the respondents that did field studies in the pilot project had a debriefing meeting afterwards, and in this setting they collaboratively created a shared meaning of the field studies as well as the situatedness of case-handling practice. This could become a part of usability work in the practice of the system developers in the future.

As a change initiative the field studies (if they would only be done once and never again) gave the system developers an understanding of the work practice of the usability professional and what usability work could be about. At CSN, the field studies became widely popular, and during the project around 100 individuals took part in the course, not only system developers, but all kinds of people involved in development. Many of the respondents talked warmly of the experience and wished to experience it again. To some degree, field studies even became synonymous with usability, which was not our intention¹⁰. However, the end-users, the case handlers become much more visible within the organization through this change effort, so the method helped to elicit the practice of the

10. The risk was, as discussed later in the thesis, that the sensemaking of usability issues led to an understanding of it as common sense. Hence, there was not a need for other complementary usability activities or the usability professional.

users. One unpredicted outcome of this change initiative was that the case-handlers started to notice the system developers, and during the annual work change program not only visited other local offices, but also the headquarters and the system developers.

To summarize, system developers doing field studies could, as a part of their practice, make them challenge the assumption of order, probe the complexities of situated work and help them understand the results that a usability professional presents. This is another kind of outcome of the method than is common in the literature and partly fits the call for not to only use the results of field studies as implications for design (Dourish 2006). As a change initiative the field studies give a vivid experience of situated work and, as such, contribute to an appreciation of what usability work could entail. Furthermore, there is a possibility that, through the field studies, the system developers could reflect on their own role in systems development and the role their practice was playing in constructing the future work situation of the end-users.

4.3 Usability Coaching

In the middle of the CSN-project, the project manager at CSN wanted a new approach in helping the sub-project managers to work harder and to achieve the change needed for the development to become more user-centred (paper II). The initial idea was that different researchers from our group would act as coaches to different individuals at CSN, but in the end, there was only one researcher involved in the coaching program. Furthermore, the coaching program was formal, but the participants could choose to not participate. The goal of the program was not only to develop personal knowledge, but also to enhance the organizational change and institutionalize usability work and user-centred design. The idea was to collaboratively create new knowledge based on the experience of both the coach as well as the individual(s) coached. Moreover, the focus was on personal reflection and understanding concerning the responsibility for usability work among those coached and how personnel at all levels of the organization could work with usability issues. There was not so much focus on specific usability methods, but rather that the coaching sessions concerned problems and conflicts when introducing usability methods and activities. The results suggest that those coached found the method beneficial but not to a great extent. This could be explained by the method being used at such a late stage in the project. Perhaps the benefits of the method would have been more

prominent if the method had been applied earlier. However, there were some substantial changes by some of those coached: they became more aware of their responsibility for usability, and they developed ways of understanding how their professional role could work more actively with usability issues.

The coaching method was a change initiative, aiming at changing the practice of systems development in a broad sense, meaning the development practice on all levels of the organization. The user of the method would be a researcher trying to introduce usability in organizations or for example, a senior usability professional working with change initiatives to introduce usability work. Consequently, I do not consider the coaching method to be an instance of usability work, in the sense that it could be used (in this form) in usability practice to build usable systems. The coaching method was used in a change situation, and, as such, it was used to probe a complex situation, that is, in a (perceived) unordered situation. Neither the practitioners in the organization nor we as researchers had knowledge ready-at-hand about how the change initiative should be carried out in full detail. The usability methods and activities as well as the values and perspectives of user-centred systems design were non-prototypical: they did not entirely fit the routines, norms and other structures that constituted the work practice in the organization. In this situation, the coaching method was a collaboratively learning situation where the coach and the individual coached together worked at understanding the discrepancy between the situation in the organization at that particular moment in time and the desired future state. Thus, the outcome of the method was mainly knowing rather than knowledge. Furthermore, the coaching session became a sensemaking tool, both on an intrasubjective and on an intersubjective level, where those coached and the coach could individually as well as collaboratively make sense and reflect on how usability issues and usability work could fit in the organization. The method opens up the possibility of reflection but does not necessarily lead to reflection. However, this can be further promoted by setting up the coaching situation to also include explicit reflection, in and between sessions.

In the FMV-project, we also aimed at using the coaching method but met resistance. Although we could not use the coaching method formally, we strived to have a coaching approach in our encounter with the personnel at FMV. Furthermore, there were situations when we took on more of a coaching role, but the character of the coaching became different. At CSN, the character was, as described above, more collaborative, creating shared knowing. At FMV on the other hand, the coaching was consultative, with us sharing facts or knowledge

that was somehow easier to convey, or actually answering questions, rather than solving problems together. The reasons for this could be manifold; firstly, the research project as such was not based on collaboration. Furthermore, we were different people compared to the coach at CSN, who had a thorough pedagogical education as a background, and thus could have another approach to coaching. One more reason could be the culture at FMV, which was in many cases truly engineering oriented, with interests in facts, figures and models, which is closely linked to knowledge rather than knowing. Furthermore, within all the defence organizations, advisors and consultants were in high regard and could be considered acting in the ordered domain, in the knowable. We promptly were considered as advisors rather than someone with whom to co-create knowledge.

Taking the experiences at CSN and FMV into consideration, the coaching method does not automatically lead to shared sensemaking, reflection and collaboratively knowing. It depends on the context and the participants (both coach and the individual(s) coached). However, by supporting reflection, shared sensemaking and collaborative knowing can be enhanced. Given its possibilities for reflection, collaborative knowing and shared sensemaking, it could be a good tool when working with problem situations in the complex domain, where there is no ready answer at hand, and where knowledge will not necessarily solve the problem.

4.4 The Persona Method

In paper III, we present two cases where the persona method was used within the SwAF. In this section I will concentrate my discussion on the case I was involved in (in paper III referred to as case two). The summary of the process of creating the personas here is brief, for a more thorough description see paper III.

In our case, the personas were developed as a support for the development of a prototype. It was the EA-project that had been given new directives and tasked to deliver a prototype of an EA-portal, a support system for modelling capabilities within the armed forces. We were asked when these new directives came to support the work with the portal, and we found this to be precisely a situation where usability work would be beneficial. In this situation, we had to negotiate during several meetings what we were supposed to do, and who could be involved in our work. This was a situation where we were doing a change initiative, showing how

usability work could contribute at the same time as creating a deliverable that the EA-project could use. The delimitations for the first version were that the portal should support the work done in the early acquisition process, where officers in Development departments write the requirement documents for military units. Our work was done in parallel with the EA-project, instead of collaboratively with them because of time constraints and political reasons. Furthermore, our work not only consisted of doing personas but scenarios and prototype sketches as well. The personas were created mainly from interview material done earlier as well as instructions from the strategic group who were the recipients of the personas. The personas were then developed iteratively through interviews with one or more respondents in every session. The respondents were shown the personas and read them through and could comment and discuss the personas. After every session the personas were developed further and even one persona was removed from the set, since it was not relevant for the SwAF as a whole. Both the development officers¹¹ the personas were portraying and the strategic group readily accepted the personas. However, the research project and perhaps more importantly the EA-project was ended before the personas could come to any use in development of new systems.

The personas from our case had only one or two sentences concerning their private life, since this was not something that the respondents readily talked about. Little private information is divergent from how personas usually are portrayed in the literature, and in our case we instead turned the secrecy into a resource. The personas were found trustworthy and real, just because they did not convey any personal details. Instead we merged the personality into the picture and the work descriptions, see figure 7 for pictures of the three personas.



Figure 7. The three personas: Kristenzon, Lars and Mikael.

11. Development officer is not a formal role in the SwAF, although they are often informally called so. I will here call the officers working in the Development departments development officers.

One of the most interesting features with the personas in both of the cases, were how readily and spontaneously the respondents started to talk about themselves and their work practice when confronted with the personas. The personas triggered much more discussions than for examples the scenarios that were also shared with them or the exercises with sticky-notes we had for eliciting details about their daily work.

The persona method, in this situation, were an instance of usability work, but at the same time a change initiative, since we wanted the EA-project to understand how usability work could benefit their own work, as well as the work of the development officers. As an instance of usability work, the users of the method could be the development officers, or perhaps more probable a usability professional working with the development group. However, in this case it was we, as researchers, who were the users of the method, which in my opinion restricts the possibility of this instance of usability work becoming a part of the work practice of the SwAF. When we exit the organization, our knowing of how to apply this method in this particular context (although described in reports to the organizations, but only partly due to the nature of the knowledge) exits with us. The personas were used in the early phases of development, in two levels, both in the early phases of a change initiative (the EA-project) and in the work practice of the development officers (the acquisition process). The personas were eliciting the practice of the development officers, that is, their annual work of writing requirement documents for the military units. This work practice was complicated, sometimes even complex or chaotic depending on the situation around them, with changing directives. But, the persona method in general is a method used in the domain of the knowable and creates or represents knowledge about the user group represented by the personas.

The persona method is often described in the literature as a design aid or a communication tool within the development group or with other relevant groups, for example marketing (Grudin and Pruitt 2002; Guðjónsdóttir 2010). Our implementation of the method, through including the development officers in the creation of the personas, showed that the persona method could have an alternative role, as a tool for helping them (the development officers) to elicit and talk about their own work practice. This readiness to talk about their own work practice was striking; it was as if the personas induced reflexivity, and there could be several explanations for this. From a sensemaking perspective, the personas act as cues, framing and bracketing the sensemaking of the development officers, giving them a focus on where to direct their awareness. Characters being an

integral part of stories (the personas also included short everyday scenarios), and stories being an integral part of the sensemaking could be an explanation for this. As Weick puts it: “stories enable people to talk about absent things and to connect them with present things in the interest of meaning ... stories are mnemonics that enable people to reconstruct earlier complex events ... stories transmit and reinforce third-order controls by conveying shared values and meaning” (Weick 1995, p. 129). Within the HCI-field, Quesenbery has also argued that it is the storytelling aspect of the personas that make them work (Quesenbery 2006). The question here could be why the scenarios did not lead to the same spontaneous discussions, if the storytelling is the important part. The answer¹² could be the aspect of identity construction. The personas, aligned with the military culture of secrecy, were without personal details and yet they appealed to the identity construction of the development officers, which is an important part of sensemaking. This is somewhat contradictory with literature on personas, for example Grudin (2006) argues that the personal details are important.

The result from the study is interesting and deserves to be further studied. One implication of this finding could be that the personas could be more purposefully used in a change initiative in order to induce reflexivity and elicit and understand both the current state and the future state. Thus, the personas would become something other than a design aid, they would become a reflexive sense-making tool for the participants in a change initiative.

4.5 Approaching Research Again

But it is not only the methods that we need to reassess with a focus on situated reflexive change. We must also reassess our own role as researchers. Situated reflexive change necessitates a research approach that can handle organizational change, probing into a complex situation, reflexivity and collaboration. Action research as presented earlier in this thesis is one such approach.

Action Research was developed in aftermaths of the Second World War, with the main founder in Kurt Lewin (Baskerville and Wood-Harper 1998, p. 98) at the Research Centre for Group Dynamics. His approach involved experiments in society where practitioners and social scientists together tried to find solutions

12. Of course there could be several answers to this question. One could be that we had not created good enough scenarios. Nonetheless, I believe the identity construction to be important.

to social problems “in a spiral of steps each of which is composed of a circle of planning, action and fact-finding about the result of the action” (Lewin 1946, p. 38). Action research also had a parallel development in Great Britain with the Tavistock Institute where Eric Trist was one of the most prominent researchers. Early on, the institute had a medical orientation trying to solve and do research on social and psychological problems in soldiers caused by the battlefields and prisons during wartime (Susman and Evered 1978, p. 587). Trist had met Lewin and was much inspired by his work. The Tavistock institute later continued action research in more industrial settings, and Trist was later one of the founders of Socio-technical systems approach (Ramage and Shipp 2009, p. 271-271).

Quite early in the history of action research the methodology became diversified, developing into different forms according to the areas within which the ideas were applied (Rapoport 1970). The positive side of this is that there are multiple sources for inspiration and information about action research. The negative side is that it can be difficult to learn more about this elusive methodology.

Literature explicitly on action research within the HCI-field is scarce, although there are some recent publications. Foth and Axup (Foth and Axup 2006) compare two cases, one where a participatory design approach was used and the other case with an action research approach. Their descriptions are somewhat vague, but action research is characterized as immersive and participatory design as being more a case of targeted research (Foth and Axup 2006). The participatory design tradition, which is central in the HCI-field could be seen as action oriented, and some include early participatory research efforts in the history of action research; see for example Rasmussen who has included the DEMOS and UTOPIA¹³ projects in his historical presentation (Rasmussen 2004). Hayes (Hayes 2012) argues that researchers within the HCI field could easily adopt an action research approach since there are many things that HCI researchers already do, that is in the action research vein, namely:

- working with community partners
- working in the field, where real problems reside
- designing and developing solutions iteratively. (Hayes 2012, p. 51)

13. The DEMOS project was aimed at understanding the introduction of computer systems at work, in collaboration with unions, and the UTOPIA project was also a collaboration with the union (Nordic Graphical Union), to develop new technological tools for skilled workers (Bjerknes and Bratteteig 1995; Bannon 2009).

Hayes argues that there are research topics within the HCI-field, where researchers are deeply involved in practice, that would benefit from adopting methods and language from action research in order to become more scientifically rigorous (Hayes 2011). In the light of the classification of Cassel and Johnson (2006), Hayes seems to be in the strain of participatory action research, with full collaboration between researchers and practitioners, from problem solving all the way to reporting the findings (Hayes 2011).

I have drawn much of my knowledge of action research from the adjacent field of Information Systems (IS), where extensive literature can be found on the subject. As with the HCI field, the IS-field is highly applied, and it is argued that action research is ideal for research in such a field because of the emphasis on collaboration between researchers and practitioners (Elden and Chisholm 1993; Avison, Lau et al., 1999).

The view of the researchers' role in action research and how it has changed over time has been discussed by, for example, Westlander (2006). Rasmussen argues that researchers not only historically over time have taken on new roles, but rather, within the same action research project, undertake different roles (Rasmussen 2004). However, an action researcher needs to be prepared to take on different roles depending on the situation at hand. For example, in the CSN project, I acted as a facilitator in workshops, as a (informal) coach to the usability professionals and as a usability professional in a pilot project. At FMV, I mostly took the role of a researcher, but there were also occasions where I acted as a (informal) coach and workshop facilitator. There is, however, a caveat with taking on different roles in research projects. In their paper, Lantz, Räsänen and Forstorp discuss role expectations in co-operative design projects, and how the researcher more often is expected to take on the role of a designer in these projects, although they do not have the skill or experience to do so (Lantz, Räsänen et al., 2006). Working with situated reflexive change implies not working as a usability practitioner or designer in organizations, but the new way of working should be done by the individuals in the organization in order to institutionalize the changes. Consequently, a researcher working with change needs to be a change agent and work with change issues. This has not been a focus area of HCI, and the question is if we as a research field should engage in this type of research. There is not an easy answer to this. I would argue that, if we want our methods to be used in practice, we need to engage in that practice, and that leads to a situation where we need to know more about organizational change. If this means that we researchers in this field now must learn about or-

ganizational studies or whether we need to collaborate with competences from other fields is a question I will not answer here. However, ignoring the change issues will not be sufficient.

Situated reflexive change also reflects back at us as researchers. We need to reflect on our research practice, and whether this practice needs to change in order to adapt to the situatedness of what we are studying. A reflective process with together with sensemaking theory can unearth our implicit sense making and construction of our research. Challenging our identity construction as HCI researchers can, for example, open up interesting and creative research questions or make us reconsider research projects. Furthermore, openness and transparency of decisions in the research process is supported by reflexivity. At FMV, we used a research approach coined user-centred guerrilla tactics in order handle the situation at FMV and the SwAF. This meant that we tried different things to fit the situations. For example, "... we explicitly decided to stop using 'user-centred' in favour of 'human-centred'" (paper IV, p. 122), in order to meet the institutional cultures at FMV and the SwAF. When we started using human-centred instead, it "... generated more relevant discussions within the organizations" (paper IV, p. 122). At CSN, collaboration led to several situations where project activities were negotiated and where we, as researchers, had to re-plan our actions. In several cases, this led to even more interesting research, as in the usability education for system developers which resulted in paper I and the usability coaching presented in paper II.

5 Beware of the Multitude of Levels

That's not a bad thing, finding out you don't have all the answers. You start asking the right questions. ... Anyone that's ever gonna get anywhere in this world has to start by admitting he's got no idea where the hell he is.

(Dr. Selvig, in the movie Thor, 2011)

Engaging in situated reflexive change and embracing a focus on reflexivity and sensemaking requires that we, as researchers, engage in several different levels at the same time. The obvious first set of levels is those of the organization, different departments and units, and different levels of management and workers. Organizational change and a situated reflexive change perspective need to address all these levels in an organization-wide approach. However, an organization-wide approach is not enough. To promote sustainable change, we need to address both what practice is and what structures this practice, the change must hence be organization-deep. This means that we need to work on all levels of subjectivity, on both the micro- and macro-level. Furthermore, addressing these issues with an action research approach imbues more dimensions, since there is a need to focus both on the actual problem setting, collaboratively solving problems, and conducting research on this change initiative. Reflexivity is needed in both action and research. However, not only is reflexivity needed in the change projects in order to analyse the outcomes of action, but there is also a need to engage in a reflexive practice in order to handle all the organizational factors, the researchers' roles, the relation to and collaboration with co-inquirers in the organization, the decisions made and the communication within and from the project. Reflexivity is needed in deciding what methods to try in pilot projects, in relation to whose voice is heard in the change project or in the research results. Reflexivity is a constant, ongoing process and can greatly enrich the research in empirical settings, but it is also cumbersome, and there is a need to find an approach that is helpful in an empirical setting.

In the FMV-project, we explicitly tried to introduce user-centred design with user-centred design as a reflexive change initiative. The overarching aim is to make sure that the technology used in the organizations is usable, and to achieve this goal we try to affect the work practice of developing technology, and, thus, the focus becomes not the end-users, but the users of the usability methods.

This was an abstraction that was hard to communicate; we ended up in recurrent discussions with the project group:

They argued that our focus was wrong and wanted us to define what benefit the end-users would get from our research. We tried to explain that the end-users would get a benefit in the end, but that our research result was a step in the right direction rather than contributing to technical artefacts in that particular moment in time. (Paper IV, p. 124)

Furthermore, there is a difficulty in engaging as researchers in doing usability practice at the same times as working with a change initiative. In our collaboration with the EA-project, we did usability work, for example, personas, scenarios and sketches. These were data they needed in their project. But we wanted at the same time to show them the actual contribution of usability work. Consequently, it was a problem of how to report to the project: should we emphasize the results that they needed or the usability methods as such? It could be arguable that this would not have been a problem if the research project had been more collaborative, and if there had been usability professionals to collaborate with. In this case, the knowing of how to apply the usability methods in this context could have been retained in the usability professionals.

Usability in itself is also layered. At CSN, the usability policy was the formal document that embodied what usability and user-centred design was. However, it was deemed to be so abstract that the usability professionals at CSN wrote another document called “Usable Usability”, in order to further clarify what it entails to work in a user-centred manner. This document became a methodology and methods document, and, since there was a lack of usability professionals in the organization, other individuals were encouraged to work in a user-centred manner. This led to a situation where usability became common sense (paper V, p. 50) rather than an issue that in many cases needs the professionalism of usability practitioners. In conclusion, it is difficult to present a complex subject such as usability and user-centred design and not lose the audience; on the other hand, if it is reduced and simplified, there is a risk that the sense people make of it is that it is common sense, and hence there is no need for (costly) usability professionals.

Finally, I would like to stress the levels connected to the duality of reality. Many of the issues discussed in this thesis touch upon things that are part of a whole like practice and structures that order this practice. They cannot, in reality, be separated, but for analytical discussion we need to separate them nonetheless.

This is like the hermeneutic circle, for example, argued as a quality criteria (Klein and Myers 1999), where we are encouraged to oscillate between the parts and the whole. By separating concepts, however, we lose the dynamics of the whole. This is an ongoing struggle: to see the wholeness, and yet the parts, without losing either the wholeness or the parts.

6 (Re)capitulating

All things are so very uncertain, and that's exactly what makes me reassured.

(Tove Jansson, Moominland Midwinter)

I have argued in this thesis that we need to adopt a *situated reflexive change* approach in order to successfully let our research results permeate and be sustained in practice. This entails collaboration with the actors that are involved in the situated recurrent actions of organizational life. Furthermore, reflexivity is a key to work iteratively, to probe the complex unknown future and include us as researchers in the change process. We can no longer talk about introduction; usability work is not a thing that we can bring into organizations, but instead we must embrace the duality of both changing the norms, routines, processes and engage in a collaborative sensemaking process. Heretofore, my research question has been answered: the answer is no. We cannot introduce usability work into organizations. We must engage in situated reflexive change.

6.1 Implications for HCI

Situated reflexive change is an invitation to reconsider HCI research situated in practice. It is an invitation to engage more fully in reflexivity, in the recurrent actions that constitute practice and to change the view from introducing to organizational change. Furthermore, situated reflexive change places an emphasis on sensemaking and an understanding of the dual nature of reality, order and disorder. The ideas presented here are not all new in isolation, whereas the synthesis is novel and is the main contribution of this thesis. The thoughts here are in line with other movements of the HCI field, for example, the third paradigm of situated perspectives, as elaborated in the paper by Harrison et al. (Harrison, Tatar et al., 2006). In the situated perspectives paradigm, sense making and multiple meanings are at the fore, as is the recognition that context affects the practice as well as the research. This, which could be called a more epistemologically diverse movement in HCI, is visible in, for example, a panel at the conference

CHI¹⁴, “The Humanities and/in HCI” (Bardzell, Bardzell et al., 2012) or the call for a shift from methods to methodology to tackle design and research on design (Williams and Irani 2010). In a similar manner does Bannon (2011) invite us to reimagine HCI, to open up the field and challenge our own thinking. As a continuation of his argument about users as human actors (Bannon 1991), we all become actors and “[p]erhaps the issue is no longer simply about reimagining HCI—it’s about reimagining, and then acting out, a better world” (Bannon 2011, p. 57).

Some of the theories presented in this thesis are fairly new to the HCI field and have promising potential as new analytical tools for HCI researchers. The two main theories with this potential are sensemaking and the Cynefin framework. The intriguing aspect with sensemaking theory is that it can be used when studying micro-changes, for example, how individuals make sense of newly introduced methods, as well as changes in a broader perspective, such as organizational changes (Weick 1995). Sensemaking theory has been used in the adjacent field of Information Systems (Bansler and Havn 2006; Jensen, Kjærgaard et al., 2009), and there are studies of sensemaking (although termed sense-making or Sensemaking, and with slightly different theoretical underpinnings) in the field of Information Science (Dervin 1998). Within the HCI-field there are scholarships concerned with sensemaking but more on the level of understanding how individuals make sense of a technological artefact (Russell, Stefk et al., 1993; Griffith 1999). Using it within the HCI field in order to make sense of usability methods or how to make these methods work in practice is one contribution of this thesis. The Cynefin framework is unexplored within the HCI field, and it has great potential as a sensemaking tool in change projects (Kurtz and Snowden 2003). Furthermore, the framework can also be used to analyse the merits and caveats of HCI methods.

This thesis has also presented a number of particulars with implications for both HCI research and practice. These are the projects presented in paper IV and V and the elaborations of some of the issues the chapter *Introducing Usability Work*. To summarize, the need for management support when promoting usability work is important, but the support must come from all levels of the organization. Furthermore, the starting point within the organization of the project can be a hindrance, and it is important what kind sensemaking individuals do of this placement. Reluctance to change is not uncommon, but it

14. The ACM SIGCHI Conference on Human Factors in Computing Systems, <http://www.sigchi.org/conferences>

can have different causes and should be, if possible, met with sensegiving and motivation. Moreover, it is important to acknowledge that working with user-centred design in organizations is an organizational change issue, and there is a need for change agents in this situation. Furthermore, change must be addressed both organisation-wide (all departments on all levels) and organization-deep, affecting both micro- and macro-levels. The usability policy at CSN is the most prominent result where both the organization-wide and organisational deep efforts met. The involvement of several departments and the union in the review process made for an organisation-wide recognition, while the review process as such gave opportunity for intra- and intersubjective sensemaking. And the policy in itself changed the macro level of generic subjectivity. Still the policy was partly disputed, and a reason for this could be that the changes did not reach the extrasubjective levels. Lastly, pilot projects have the possibility to be influential and are a possible situation to create new or affect already existing practice. However, pilot projects are also very troublesome to set up and work through. Therefore, great care should be put into designing pilot projects.

The first three papers included in this thesis concern methods used in our research projects. The intentions when using these methods have been partly different from how I present them in this thesis. Here I have expanded the results from the papers with theories of sensemaking, knowledge/knowing and the Cynefin framework. The reason for this is to show how these methods could be tools when working with situated reflexive change. Hence, field studies by system developers could be viewed as a tool for making sense of usability work; personas could be used as a tool for inducing reflexivity in and on practice; and usability coaching as a collaborative sensemaking tool in order to understand and work through change.

6.2 It Could Be Otherwise

Some issues in this thesis have been taken (more or less) for granted for the sake of the argument. Usability and user-centred design are two of them. As mentioned earlier, there is criticism of usability as a concept, and a reasonable objection could be that perhaps usability was not the problem in these organizations. I would argue that usability was not the only problem, but it was definitely one of the problems. The systems that the case-handlers at CSN worked with had poor usability; the technology used by the soldiers at the SwAF was sometimes not only difficult to use, but it was even hazardous. Addressing the usability for

these systems could have improved the work environment and health of the case-handlers and soldiers. Nevertheless, there are many other issues that suitably addressed could also have improved the working life in these two public authorities. I would argue that finding the “true” problem to be addressed is futile, since the complexity and ongoing nature of organizational life make it difficult to pinpoint any one problem as the most accurate. However, adopting a reflexive, iterative, and collaborative approach to working through organizational problems would open up for reconsiderations during the project and possibilities to deviate from the initial plan. This means that we must become better at challenging our own thinking and work more holistically with work environment and technology in a collaborative manner.

With the precondition that we had chosen usability as our main concern, user-centred design was not necessarily the only possible approach. There is criticism of user-centred design, for example Cockton (Cockton 2012) argues that user-centred design has been too focused on users and evaluation, and thereby is weak on the balance between artefact, designer and user. In the context of my research, the choice of approach was partly because of the historical setting (as I was situated within a research group that had developed user-centred systems design (Gulliksen, Göransson et al., 2003)) as well as a choice made collaboratively in the project group in the action research project. However, in both research setting, the focus was not only on the user, but also on wider issues, concerning organizational goals, values and work environment. Furthermore, the research presented here has been influenced by other methodologies, for example action research and reflexivity, as well as different bodies of theories not usually associated with user-centred design. Some of the results from my research stem from the focus on usability and user-centred design. However, the main claim in this thesis (apart from the mere fact that we cannot introduce user-centred design), the situated reflexive change approach, can be generalizable to any situation where practice is to be changed. And with this final thought I would like to direct my gaze to the future.

7 Up and Beyond

But then, the boy said, frowning at the stars, is the balance to be kept by doing nothing? Surely a man must act, even not knowing all the consequences of his act, if anything is to be done at all?

(Ursula K. Le Guin, The Farthest Shore)

Everything changes. The world around us will not stop spinning and our civilization is reputedly standing in front of enormous challenges. We are threatened by economic collapse, climate change and a scarcity of resources. Is the work practice still important? I would argue yes, it is. Perhaps even more so. It might also be debatable whether getting our research results into practice should be part of our own practice as researchers. But if it is, as I believe it is, we need to acknowledge that this is about change and hence, we need to understand change. Sensemaking and the situated reflexive change approach presented in this thesis is only one line of inquiry; there is more out there to research and learn. The situated reflexive change approach also need to be developed and tested in practice. One obvious future path would be to continue with action research efforts and put the methods presented in this thesis to the test. Are they actually good as sensemaking tools?

However, I would like to, in this very last section of this thesis, challenge the HCI field. How can our knowledge and knowing be applicable, and benefit the looming future ahead of us? What is our responsibility as researchers in the HCI field to enact a better tomorrow? I believe we have methods and approaches that can benefit and enrich this tomorrow and other fields of research. To do this we need to increasingly engage in multidisciplinary endeavours to address the complex and chaotic future reality. I would for example like to see how the persona method, as a sensemaking tool, could enrich the scenario building and planning for a sustainable future both in research and in practice. We can, as HCI researchers, contribute with new perspectives on the relationships between humans, technology and the world around us. How can we design and create technologies that are resilient and robust, technologies that can help us meet the challenges of tomorrow?

Everything changes; let's make sure not everything will stay the same.

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