Studying Technologies *in Practice*: Ethnographic Research into Socially Embedded Technologies

Pernille Bjørn & Nina Rødje-Boulus
IT University of Copenhagen
pbra@itu.dk, nbou@itu.dk

Abstract. This document describes our approach into socially embedded technology research in general, provide examples of our research in particular, as well as present our interest in joint research initiatives based on the EUSSET network. Our main research interest is to study *technologies in practice* as in the co-existence and relationship between people and technologies in their organizational practices with the aim of contributing to the design of collaborative technologies. Our main interest in the EUSSET is to group up with other researchers who have the same interests but different competences and approaches so that we together can compliment each other and contribute to moving the field forward. In particular, we would like to collaborative with researchers of a more constructive technical interest who see the value of interdisciplinary research. Furthermore, we have an interest in co-authoring a joint EU application with other researchers from the EUSSET network if there are common interests and benefits to be shared. We plan in our presentation at the EUSSET workshop to present our approach by providing examples from 4 empirical studies; two completed projects conducted in Canada in the area of Healthcare IT and two ongoing studies of global software development and technologies for democracy. Moreover, we will also explain our ethnographic method combined with action research, which are the methodologies we have been deploying in all four projects. We hope these examples will provide other EUSSET researchers with an idea of what we do and how we would like to continue in future research.

Research approach

Studying technologies in practice we are following the Computer Supported Cooperative Work (CSCW) tradition for work place studies (Luff, Hindmarch et al. 2000; Randall, Harper et al. 2007) and have in particular conducted research in the healthcare area, studying emergency departments (Bjørn and Balka 2007; Bjørn and Rødje 2008; Bjørn, Burgoyne et al. 2009; Bjørn and Hertzum 2011), investigating the introduction of electronic medical records in the primary and acute sector (Boulus 2004; Boulus and Bjørn 2007; Boulus and Bjørn 2008; Boulus 2009; Boulus 2010; Boulus-Rødje submitted) as well as studying tele-monitoring practices of patients (Andersen, Bjørn et al. 2010). We have conducted both single sited studies as well as comparative studies (Boulus and Bjørn 2007; Balka, Bjørn et al. 2008). In all these studies we have applied ethnographic methods to study the collaborative and complex practices of the particular sites, with the aim of developing theoretical concepts useful for describing and articulating practices while informing design of technologies that support the local and situated practices (Schmidt 1998).

In each of the studies, we draw upon an action research approach, which has a dual agenda of contributing both to research and to practice (Rapoport 1970). This implies that we have engaged in closely-coupled work with the practitioners and have taken an active role in making our contribution relevant for them. The above-mentioned studies were conducted in Canada, Norway, and Denmark. More recently we have started to reflect on what these types of engagements mean for research and for practice, and on ways in which we can continuously evolve and sharpen further our work (Bjørn and Boulus 2011; Boulus-Rødje submitted; Boulus-Rødje submitted; Boulus-Rødje and Bjørn submitted).

While we have a strong record in the areas of healthcare work, our current research interest is moving to different empirical domains: Global interaction and Technologies for Democracy. This implies that while our research approach and method remains the same, the field of study is different.

Current research projects: DemTech and NexGSD

DemTech: Nina is currently involved in a large action research project called *DemTech* (2011-2016), which brings together computer scientists and social scientists with the aim of studying the design and implementation of e-voting technologies. Due to the fact that the design and implementation of these technologies has predominately been vendor-led, it is important for the researchers to explicitly distinguish their research project from vendor-led innovations and detach themselves from any political and/or commercial interest. DemTech is, however, a strategic project, which implies that although it is led by

academic researchers, it is conducted in close collaboration with the three biggest municipalities in Denmark and two IT-vendors, all of whom are partners on the project. The project started in July 2011, and so far, the research team conducted ethnographic studies of the presidential election in Denmark (including the planning, implementation and evaluation phases of the election), as well as attended two seminars for municipalities' staff (one that prepared staff for the upcoming election and one that evaluated the election). The team also attended various meetings with different stakeholders, organized a public event at the parliament (described below), as well as participated in various public debates in the media. Throughout these different events and contexts, the team constantly and explicitly emphasizes that their academic work is led by science, taking a clear distance from any political and financial interest. The researchers have, therefore, gradually created a reputation of 'science led' project, an independent scientific academic project.

Although the research project is still young, already by the end of December (2011), the team had been invited to take upon many different roles. For instance, the municipalities that are partners on the project invited the team to evaluate their work practices and help them showcase the need for e-voting technologies; one of the vendors invited the team to meet other stakeholders and businesses involved in elections; the team have also received requests from other municipalities who wish to join the research project; one of the vendors invited the research team to conduct an experiment together with him where his e-voting machines are tested with real voters; the research team was also invited by several municipalities (both those who are partners on the project and those who are not partners) to join the effort to change the law in Denmark which at the moment prevents from experimenting with e-voting technologies, etc. Furthermore, the research team have also been invited to meetings with stakeholders from different countries who wish to implement e-voting technologies (i.e., Africa, Philippines and Egypt). In November 2011, some of the team members went to Egypt to participate in initial discussions about the possibility of implementing e-voting technologies after the popular uprising in the spring.

As can be seen from the above, during the very short period of this project, the research team have already been drawn into different directions, invited to take upon different roles, and to create different attachments with various stakeholders. These different invitations and roles change depending upon the contextual circumstance as well as the political context existing at a particular point in time. For example, the push to change the law initiated by the municipalities was partially influenced by the fact that Norway newly had a pilot project testing internet voting. This pilot project increased the pressure on the Danish municipalities who have already attempted to change the law ones a few years ago but with no luck. The context surrounding the DemTech project has been continuously and rapidly changing, influencing the opportunities and types of

roles and interventions that the research team receives at different moments in time.

NexGSD, Pernille is current involved in a large project on Global software development (2011-2015), which includes collaboration with three companies each producing software in geographical distributed projects. Fieldwork is currently taking place in Denmark, Phillipines, and India. The NexGSD project has three phases: studying GSD practices, designing new tools for GSD, and evaluating the tools in practice. In this way the final products and interventions are technical tools. However, part of the work in this project also includes producing descriptions of the complex and situated work practices. These descriptions have been used for different purposes, including creating oral presentations for the company where the research team have synthesized their experiences and reflections of the practices, turning these into articulations of the work. When the team bring these descriptions back to practice, they shed light on the invisible work and question the taken-for-granted assumptions upon which the work is based. These descriptions make it possible for the researchers to engage in a dialogue with practice concerning the experienced challenges, and as such these descriptions matter and they can have an affect on practice. Descriptions of work practices have the potential to become interventionist descriptions. Looking at what interventionist descriptions do in practice, in this case, they are used to question the taken-for-granted assumptions and to prompt questions which affect the practice. Examples of such concepts in the current work comprise communication (Bjørn and Christensen 2011; Jensen, Storm et al. 2011; Korver-Michan and Bjørn 2012), relation work (Bjørn and Christensen 2011), global spaces and places (Bjørn 2011), the use of documentscape in GSD (Christensen and Bjørn in progress). Issues about culture is also an recent interest (Yasouka and Bjørn 2011; Jensen and Bjørn in progress).

Another key point from the NextGSD project in terms of interventions, is that we suspect that the key interventions directly relevant for the involved companies will probably be the interventionist descriptions rather than the prototypical technical interventions of tools. Since the descriptions can be used directly in the process of improving the practice (e.g. in changing practice) where the technical artifacts will be in terms of prototypes, which will be tried in practice, but will require much work before they will be able to function outside the lab or researchers control in real life. It requires much work outside the boundaries of research to make technical prototypes into real life functioning systems. This is not to say that we do not strive to make functional technical prototypes in the project; rather, the work of taking laboratory prototypes into real life is normally not part of the research project.

Future Research

Currently we are both very much involved in ongoing large strategic research projects both spanning across fairly diverse and interdisciplinary research groups. However, we have an interest in initiating new research projects together with other researchers in the EUSSET network, focusing on the role of technologies in the domains of global interactions and democracy. We hope to discuss further our research interests and see if there are shared interests within the network that can enable fruitful and interdisplinary collaobration. Generally, we are interested in researchers with a technical approach and an interest in designing, building, and contructing collaborative technologies and can see the value of working with ethnographic researchers as us. We look very much forward to the work and to see how other scholars in the EUSSET network conduct research into social embedded technologies.

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