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Pilot implementations and learning in CSCW settings

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Abstract. Pilot implementations of new technology in organizations have been proposed as a promising approach to uncover emergent knowledge and learning of the specific work practices in which they are implemented. In this research proposal I will discuss how a participatory approach to evaluating CSCW applications may support mutual learning.

Research context

My Ph.d.-project is a collaboration with the public healthcare sector in two Danish regions: Region Zealand and Region South Denmark. The project is to evaluate a pilot implementation in which 17 ambulances in the Region of Zealand will be equipped with electronic ambulance records (EAR), testing the transition from paper to computers over the course of 6 months. A Norwegian vendor will supply the software and hardware necessary (a touchscreen-based tablet).

The EAR will attempt to both support situated work and situation awareness in the ambulance as well as activity awareness of the ambulance work at the ED. However, the first step of the implementation will seek to support the ambulance crew in documenting the patients. The second step is to integrate this information with electronic whiteboards at the emergency department (ED). The IT artifact has an important strategic perspective: closing the minor emergency departments in the regions, removing physicians from the ambulances and replacing them with paramedics. The ED personnel wants the EAR to continuously supply measurements

of vital parameters about incoming patients to their electronic whiteboards. The ambulance crew wants to ensure that the clinical observations they produce as part of the ambulance records are also used by ED personnel.

The political goal overall is to support information sharing and use of patient documentation throughout the patient trajectory from ambulance pickup to discharge from the hospital, thus reinforcing the transition from prehospital to hospital care.

In my involved research group, an evaluation framework called “Effects-driven IT development” (EDIT) is currently being developed and tested. EDIT is an evaluation method for systematically and iteratively evaluating desired effects of the new work system constituted by implementing new technology, preferably as part of a *pilot implementation* (Hertzum and Simonsen, 2011). These effects are specified and evaluated using participatory techniques, involving the participants whose work practices will be affected by the new technology. Pilot implementations have been proposed as a promising approach to mutual learning about how the IT artifact is used in real working settings (Bansler and Havn, 2009). Mutual learning is a participatory design concept denoting the learning that occurs when designers and practitioners engage in shared activities towards a common goal (Bødker et al., 2004). However, very little literature exists on what kinds of learning and knowledge emerge and how to go about conveying this in real work settings. In my project, I will experiment with the EDIT framework in a pilot implementation setting to better understand this somewhat intangible concept of learning.

Hence, my working research question is: “*What kinds of mutual learning occur in participatory evaluations of pilot implementations?*”

Previous work on evaluations in CSCW settings

Evaluations of CSCW-applications are scarce in the research literature (Plowman and Rogers, 1995) and ridden with obstacles (Neale et al., 2004) for a number of reasons. For example, it can be very difficult to assess or measure who will actually reap the benefit of the work performed as well as define those benefits during use. Several methodological attempts have been made: using situated and informal interviews to assess evaluation (Twidale et al., 1994), as well as arguing for mixing both qualitative and quantitative methods to assess communication needs (Neale et al., 2004).

For groupware that support long-term cooperative activities, Neale et al. (2004) present three major obstacles: (1) difficulty in coordinating logistics of data collection as the use of the CSCW application often is done synchronously between groups; (2) there are many contextual variables to consider, both on an individual usability level, social group level, and on an organizational level; (3) work practices change when new technology is used and there is a need for validating the newly re-engineered work as it changes (Neale et al., 2004).

Clearly the EAR-project stands before the challenges presented by Neale et al.

(2004). Although impossible to solve completely, I will try to discuss how to minimize their effect on the project in the following.

1. Problem: complexity of logistics of data collection.

The complexity of evaluating a CSCW application in an ambulance is large because it is a mobile setting, further complicating where to gather data from and how to gather data in the communication situations between ambulance crew and ED. To minimize this problem, I will be taking a mixed method approach, mixing both quantitative and qualitative methods. Quantitative surveys in the ambulances will be filled out by the ambulance crew after each patient hand over, and analysis of usage logs of the IT artifact will be used to get representative knowledge about satisfaction, performance and “how” it is used. Data about the specific use, communication and information sharing and activities of ambulance crew and ED personnel is much more complex, though. To understand “why” the IT artifacts is used, observations following the ambulance crew and the patient all the way to the ED will be performed, focusing on the use of the EAR and how it changes hands. Observations and informal in-situ interviews at the ED will also be performed.

2. Problem: many variables on individual, social and organizational levels.

Taking a participatory design-approach to data collection, the project will involve stakeholders on a political level to the ambulance crew and ED personnel whose work practices are influenced by the technology, ensuring that all stakeholders may influence the focus of the ongoing evaluation activities from start to finish. An ongoing dialogue may ensure that the variables and events on individual, social and organizational levels are discussed and prioritized as the project moves on, thereby reducing the amount of variables to take into consideration.

3. Problem: the need for testing in a real work setting:

Focusing data collection on the re-engineering aspect of work practices will contribute to the overall research question: “What kinds of mutual learning occur in participatory evaluations of pilot implementations?” As the project is based on the structure of a pilot implementation, only real-life usage of the new technology will be evaluated. This may assure validity towards getting “real” results as opposed to results from a controlled laboratory setting. A force of the specific setting is that only 17 ambulances in the region will be equipped with the EAR technology, enabling a possibility for comparison between work systems with and without the technology.

Research design and originality of work

The overall research design is based on action research with cyclical interventions playing a central part (McKay and Marshall, 2001). Interventions in this project

will take the form of workshops, questionnaires evaluating the CSCW application, and formative feedback of evaluation results to the participants through interviews, hopefully ensuring participants' focus on mutual learning and the effects that occur as a result.

The pool of empirical activities consists of the following:

- Observations of work before and after implementation of EAR.
- System logs: data with time stamp and system usage will be analysed and compared to each other.
- Survey data: A questionnaire pops up on the screen of the EAR after each ambulance run when a patient has been handed over.
- Experience-gathering semi-structured interviews: The semi-structured interviews will gather qualitative data about attitudes towards the system.
- Workshop with stakeholders present (ambulance crew, ED personnel and management) as fellow evaluators of the desired effects.

My contributions to this project will be to the existing discussion of how to evaluate CSCW applications, taking an effects-driven participatory approach. As my research question is centered around learning, I will also contribute to exploring mutual learning in real-life evaluations of pilot implementations.

I would like feedback on the following: a) The rigor of the research design of the project, b) The relevance of the project (how do you see interesting aspects of CSCW in this?), c) How my focus and research question can be even sharper, d) What could help my empirical activities.

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