From work analysis to design

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From the very beginning of our research at the HCI-department at Uppsala University we have relied heavily on a user perspective that implies that real users and their needs must be in focus early on and continuously, in design and work development projects that aim to bring about usable systems (in line with early HCI research e.g. Gould, 1988; Bjerknes, Ehn & Kyng, 1987; Norman & Draper, 1986).

Another of our ambitions has been to accomplish research that is strongly related to working life and largely conducted in natural settings (Gulliksen, 1996; Göransson, 2001; Åborg, 2002). The research focuses very much on methods for analysis used prior to the initiation of the systems development as well as on methods for user-centered systems development (Gulliksen & Göransson, 2001). Work activity analysis and information utilization analysis are considered precursors to any systems development (Gulliksen, Lif, Lind, Nygren & Sandblad, 1997). During the work activity analysis, uncalled-for or obsolete procedures and tasks are identified; such procedures are frequent at workplaces supported by administrative systems, where much of our research has been performed.

You often here developers comment on systems being developed according to user requirements and when delivered, the users don't like them anyway. As a result, developers understand users as unpredictable human beings that regularly change their minds. When a process of change is initiated, it is difficult to envision what the future work situation will be since people are occupied with the current work situation and its inherent routines. It is not possible for users to deliver "upfront" the appropriate requirements or demands on the new system, since they are not aware of all possibilities. As a user, you may have ideas and visions about how tasks should be performed in a new system, but without a mockup or prototype with hands-on opportunities, it is practically impossible to judge whether the new system will hinder or help. Furthermore, new possibilities can initiate the development of current work practices (Vicente, 1999), for that reason, reorganizing work is as equally important as creating new programs (Beyer & Holzblatt, 1998). This is knowledge that designers and developers themselves must possess - they can never expect users to do their jobs for them. User – designer collaboration can work. Nevertheless, regarding users simply as providers of answers to questions and providers of requirement specifications is not a solution.

The transformation of knowledge from analysis into design is often regarded as a straightforward process where you capture, elicit and construct the requirements of a software project. This is a false image that simply doesn't match reality. Requirement specifications and the way such documents are "frozen" early in the process of systems development does not comply with the human world of work.

The problem of achieving a practical contribution from an extensive work analysis to systems design has been under debate for a long time. Ethnographic records offer a potential for uncovering tacit knowledge and understandings embedded in work activities (Hughes, Randall & Shapiro, 1993). The big question is still how to make e.g. observations, findings from interviews

and similar data informative for the design, in particular for those who has not been involved in the process of collecting that information.

The following conditions are, to my knowledge, prerequisites for a successful transformation of knowledge of work to an efficient and supportive system:

- A methodology that promotes user-centred design by supporting modelling in a user-familiar terminology.
- An effective dialogue between the different competencies involved in the process.
- Possibilities and *resources* for rapid prototyping and iterative development.

In light of previous experiences in detailed cognitive work analysis, participatory processes, and iterative prototyping, I would like to discuss new approaches to the creative leap from analysis to design with fellow doctoral students.

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