Non-formal Techniques for Requirements Elicitation, Modeling, and Early Assessment for Services

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ABSTRACT
Designing systems for multiple stakeholders requires frequent collaboration with multiple stakeholders from the start. In many cases at least some stakeholders lack a professional habit of formal modeling. We report observations from two case studies of stakeholder-involvement in early design where non-formal techniques supported strong collaboration resulting in a deep understanding of requirements and of the feasibility of solutions.

Keywords
Requirements elicitation, stakeholders, non-formal modeling

INTRODUCTION
In user centered product design a strong tradition exists of starting from a task model, subsequently developing a detailed design model (often structured along functionality, dialogue, and representation), model based prototyping and evaluation, ending in formal specifications (Van Welie and Van der Veer, 2003). However, since increasingly design efforts focus on services (i.e., opportunities which often will be new including the context of use), the stakeholders of the new service are unable to precisely formulate and formalize their needs, ideas, and the context of the envisioned service (Vyas et al., 2010). Sommerville (2005) points to the need of flexible requirements elicitation techniques, both for single user type situations in the phase of feasibility study, and for the current service context: stakeholders often do not know what they need, do not agree, and requirements change during the analysis.

Sommerville’s elicitation techniques are viewpoint oriented, but the problem is how to identify future viewpoints. Ethnography does not work since there is no existing system and related community of practice. In addition, we need to consider that not only the requirements but also the context will change through putting the novel services in practice. An obvious solution is the use of scenarios to envision, in collaboration with the stakeholders, how a new system may be used in practice.

IT supported services are new, and in many cases are meant to be new. Stakeholders will only have vague ideas if at all, and mostly have no clue about other stakeholders, about differences in context and culture, nor about relevant functionality and opportunities. The traditional and well grounded tools and techniques are not sufficient for this emerging domain of design. We will illustrate our observations and emerging approach by two case studies, featuring: (1) co-design merging ethnography with rough prototyping; and (2) bootstrapping service design techniques.

CASE STUDY 1: FROM ETHNOGRAPHY TO PROTOTYPE USE
Team work is characteristic for industrial design. Teams are often multidisciplinary. Collaboration on design is often not a purely verbal activity. State of the art ICT seems to provide intriguing tools for motivated teams. Based on prior ethnographic work in design studios and with student design teams (Vyas et al., 2009), we developed a simple tool, CAM (Figure 1; Vyas, 2010).

Figure 1. Short explanation of CAM

CAM allows team members to tag physical design objects, to add information to any tagged object by sending a tweet to them, and to read the tweet log of each object. We found three different teams of design students not only tagged and communicated to (1) 3-D mock-ups; (2) sketches, textual descriptions on paper, and combinations of these; but also (3) abstract references, like an empty sheet of paper only marked with, e.g., “vote on this”, or “Planning”. Subsequently these tagged objects became related to a history of tweets on votes and opinions about a proposed design

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decision, resp., a history of tweets regarding a planned process and its actual deviations and updates.

Another surprising way of using CAM was the opportunity to express emotions and aesthetics: e.g., a sketch for a night lamp triggered several “poems” by different “authors” (originally in German):

- “the shiny-man, who shines on us. Whether day or night, no matter what”
- “the sun in the morning, the stars at night, slowly accompany us into sleeping tight”

In general, the tryout of CAM learned us that non-formal contributions to design were appreciated and we consider this a potential support for collaboration and shared creativity. Discovering new opportunities and functionality just “happened”, though the tool seemed to systematically trigger certain new types of functionality.

**CASE STUDY 2: BOOTSTRAPPING SERVICE DESIGN TECHNIQUES**

When developing a brand new course on service design, there were no course books available, and only a single repository for techniques (Tassi, 2009). Our students, worked in design teams for real clients to develop services with many different types of stakeholders outside the clients’ business with clearly different corporate and geographical cultures (e.g., in tourism industry).

We pointed the students to Tassi’s repository as well as to Hofstede and Hofstede’s website (2011) and to the Cultural Survival Kit (2010), as well as to design documents from the UK Government and to our visual design pattern wizard (De Moel and Van der Veer, this volume). We additionally introduced them to the design approach by Tassi.

We asked our students to study these sources and to teach each other the different techniques and tools. During the design process we challenged them to decide for each phase which of the tools and techniques offered were relevant. The students’ progress report showed how the various different non-formal techniques, applied to a co-design approach where different types of stakeholders (e.g., both hotel owners, tourist information providers, and visitors; see Figure 2) collaborated in generating ideas (Figure 3) as well as assessing these before any services were actually implemented, brought unpredicted initiatives that were accepted and actually supported by the stakeholders.

**REFERENCES**

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