Usability analysis of collaborative tools: a team usability testing approach

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Abstract. Nowadays most people work in teams and team members usually work together using collaborative technology, which creates a special problem when evaluating usability. I argue that the existing methods: group usability testing method (Chen et al., 2013), collaboration usability analysis method (Pinelle et al., 2003) and team usability testing method (Hackman & Biers, 1992) do not cover all aspects of team usability. The main contribution of my work is examining people who work together as a team, on the same task, with the same collaborative tool, using separate computers. I analyze problems that arise using communication analysis, behavior analysis (on-screen behavior), and post-experiment interviews. In my doctoral research I propose and test a new team usability testing method which helps to explore team level usability problems and translate these findings to improve user experience of collaborative tools.

Research questions

The importance and usefulness of usability testing in design is confirmed in the literature, there are several well-tried methods for individuals, which have already proven their effectiveness (Nielsen, 1994; Rubin & Chisnell, 2008). But nowadays most people work in teams using collaborative technology which creates a special problem when evaluating usability. There were already a few research attempts which tried to solve this problem.

The first is the group usability testing method (Chen, Lau, Chuah & Teh, 2013) in which several individuals are tested at the same time in the same room by
several researchers. In other words several individual tests are taken, which are not capable to examine team-level phenomena, because the participants do not collaborate.

The second is the collaboration usability analysis method (Pinelle, Gutwin & Greenberg, 2003). As the authors state “CUA’s main contribution is to provide evaluators with a framework in which they can simulate the realistic use of a groupware system and identify usability problems that are caused by the groupware interface”. So CUA is an analytical method which does not involve users.

The third is team usability testing (Hackman & Biers, 1992). In the team usability testing method two people work together as a team, but only one uses the computer and the other is “just” an advisor. For most CSCW research two people are not considered as a team, besides these two people do not have the same possibilities for collaboration.

The main goal of my work is examining people who work together as a team, on the same task, with the same collaborative tool using separate computers. I believe that the usability of a collaborative tool should be examined with a team-level method, besides the other methods. I argue that there are usability problems which only occur while collaborating in a team situation and are impossible to be explored in an individual situation. So the main attempt of my doctoral research is to create a team usability testing method which helps to explore team-level usability problems.

The research’s questions for my doctoral research are the following:

- How does team usability testing differ from other usability testing techniques?
- What is the added-value of team usability testing compared to other usability testing techniques?
- How can the results of a team usability test lead us to better understand the usability problems of a collaborative tool?
- How can the results of a team usability test lead us to better understand the operation/collaboration of a team using a collaborative tool?

Methodological approach

In the early stage of my PhD work, together with my university colleagues, I had the opportunity to perform several individual usability tests on NOSTROMO, which is a project management tool, mainly for software development teams. Working together with the UX experts of NOSTROMO team was a really great experience, the tests went well, and we got valuable results for the further development and design. But as we talked through the results of the tests I noticed a gap: we know nothing about the usability problems occurring in a collaborative situation. As NOSTROMO’s main goal is to help collaboration, this can be an important aspect.
This problem really bothered me, so I started looking for solutions. I did not find that the existing methods covered every aspect of team usability, so I decided to create a new method.

I intend to explore usability problems in a team situation using a combination of qualitative and quantitative approaches. First, I plan to make explorative interviews with subject matter experts to identify important aspects about usability of collaborative tools. The interviews will help me to better transform real world phenomena into meaningful and measurable variables (Pinelle et al., 2003; Geszten, Hámornik & Hercegfi, 2015). Then I am going to perform a pilot usability test in a lab with small teams (3-4 members).

In the pilot study I am going to use communication analysis, behavior analysis (on-screen behavior) and post-experiment interviews. I am familiar with these methods from previous research experience (Geszten et al., 2015; Geszten, Hámornik, Komlódi, Hercegfi & Young, 2016). The key point here is that the methods applied must be non-invasive, so that the measurement won’t break the flaw of team communication and collaboration. I am going to record and analyse the communication (verbal and written) of the team while the team members are working on a common task. The task of the pilot study has an essential role. Because of that, in the explorative interviews I am going to ask the opinion of subject matter experts about the task. From the communication data I am going to identify patterns. One of my goals is to examine the relationship between team collaboration and usability problems. I am going to record the behavior of each team member with a screen recorder program. After the task I am going to interview the team members about their opinion about the usability of the collaborative tool. I think with the help of this method I can examine the complex usability problems which occur in a collaborative scenario.

Work to date

I am currently working on the pilot study, which I’m going to perform in a laboratory setting. The first is to conduct the explorative interviews with subject matter experts, so I started to work on the questions and organize the interviews. Based on these interviews I am going to define my variables and the detailed task of the pilot study. After I conducted the pilot study I am going to improve and refine a team usability testing method.

Next steps

After using what I’ve learned from pilot and other experiences I am going to perform a field study in a real working environment. In the field study I want to broaden my focus of research, and I want to examine other collaborative
technologies which a team uses. What I expect from the field study that it will
provide an even more deeper understanding of the usability needs and problems of
teams while collaborating.

Expected contributions

My main expected contribution is to understand the usability needs and problems
of a team and translate these findings to better usability and user experience of
collaborative tools. The goal of my doctoral research is to create better
collaborative tools by exploring usability problems on a team level with the help
of a new team usability testing approach.

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