

# Evaluating a Ubiquitous Service Environment for collaborative work

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**Abstract.** This poster describes an evaluation of a ubiquitous service environment, USE. The purpose of the environment is to support collaborative work. In this evaluation we have studied students on a multimedia design course, working in the USE with the first phase of their design process. The aim of the study has been to evaluate the environment as a whole and get an understanding of how a ubiquitous service environment can support collaborative work. Initial results show that the environment supports collaborative work, and that the students worked more effectively. The participants' comments indicate that working in a USE actually equalizes the roles of the group members.

## 1 Background

At KTH a ubiquitous service environment called the iLounge has been designed and built. A ubiquitous service environment, USE, is a space where users can collaborate supported by multiple services providing computing and communication facilities. The room is equipped with three large displays built into the wall, where two of them are touch-sensitive Smart Boards (SMART Technologies, 2003). In front of this wall there is a table with a horizontally embedded plasma screen, also touch-sensitive. This interactive table is large enough for 6 to 8 people to sit around. There is a wireless LAN, and users bringing personal equipment only need a WLAN-card to get access to the local network.

The purpose with the iLounge is to support meetings and collaborative work; work where people share and create information. In a situation where a group of users are interacting with a collection of computers, there is a need for new interaction styles. Moving a document or a file from your personal artefact (laptop, PDA, etc.) onto one of the displays in the room, or moving digital objects between the computer displays in the room must to be easy. In the iSpaces project (iSpaces, 2003), different kinds of software services have been developed to support this kind of interaction. In our study the students were using the services PointRight, Multibrowse, and iClipboard, all part of the iWork services (iWork, 2003) package. They also used a service called Tipple (Tipple, 2003), which makes it possible to move any file between computers by an easy drag and drop operation.

This is the first study performed in this environment that is not experimental, and where the participants have a real task. The aim of the study has been to evaluate the environment as a whole and get an understanding of how a ubiquitous service environment can support collaborative work.

## **2 Subjects and task**

Five females and four male students in the ages of 21 to 45 participated in the study, divided in two groups. The students were attending the course “Methodology for design of interactive systems”, at the Department of Computer and Systems Sciences, given in the third year of a four-year education program. The task for the students was to design a digital, multimedia guide for the Swedish Museum of Natural History. We followed them during the first phase, when they were doing the conceptual design of the multimedia guide. The design phase consisted of brainstorming, sketching of scenarios and the multimedia product, and information search.

## **3 Method**

The student groups worked with the conceptual design for two weeks (in the end of March 2003). During this time each group had five three-hour sessions in the iLounge. The participants received an introduction before the study started, where we showed them the specific services of the iLounge. For their task we also introduced some of the software from the SMART Technologies, e.g. Smart Notebook, which is an electronic whiteboard application, where one can create documents containing typed text, hand-written text, and/or pictures. The participants were also supplied with a laptop computer.

Before the study began a pre-study questionnaire was handed out where we asked questions about the participants’ preferences of group work and experiences of technology like Smart Boards, etc. After the study we gave them a follow-up questionnaire and made a semi structured group interview. The questions mainly regarded the group work in the iLounge, and how the

environment supported their work. Both the work sessions and the interviews were video taped.

## 4 Initial results

All participants appreciated working in an environment like the iLounge, and they all grasped the new services available rather fast. They used the whole workspace, but mostly the two touch-sensitive wall displays for making their sketches, as Figure 1 shows, or for showing information found at the Internet to each other. The participants experienced that the work process had been more effective than group work normally is, but it is hard to say if it was due to the group or to the actual environment. They also said that normally when having group work sessions, people get different roles, but when working in the iLounge all group members had equal status. An advantage with the USE is that it allows working in various ways. For example, some of the participants preferred to work at the Smart Board directly using the pencils or the fingers for drawing and writing, while others preferred to sit down typing and inserting pictures, or look for information at the web on one of the computers in the room.



Figure 1. A student group discussing their design sketches

## 5 Acknowledgements

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## 6 References

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