Chapter 8.4
Field Evaluation of Collaborative Mobile Applications

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ABSTRACT

This chapter presents a usability evaluation method for context aware mobile applications deployed in semi-public spaces that involve collaboration among groups of users. After reviewing the prominent techniques for collecting data and evaluating mobile applications, a methodology that includes a set of combined techniques for data collection and analysis, suitable for this kind of applications is proposed. To demonstrate its applicability, a case study is described where this methodology has been used. It is argued that the method presented here can be of great help both for researchers that study issues of mobile interaction as well as for practitioners and developers of mobile technology and applications.

INTRODUCTION

Mobile devices are part of many peoples' everyday life, enhancing communication, collaboration, and information access potential. Their vital charac-

teristics of mobility and anywhere connectivity can create new forms of interaction in particular contexts, new applications that cover new needs that emerge, and change the affordances of existing tools/applications.

A case of use of such devices, with particular interest, concerns *public places rich in information* for their visitors, in which mobile technology can provide new services. Examples of such places, are *museums* and other sites of culture (Raptis, Tselios, & Avouris, 2005), *public libraries* (Aittola, Parhi, Vieruaho, & Ojala, 2004; Aittola, Ryhänen, & Ojala, 2003), and *exhibition halls* and *trade fairs* (Fouskas, Pateli, Spinellis, & Virola, 2002). In these places, mobile devices can be used for information collection and exchange, for ad hoc communication with fellow visitors, and for supporting face-to-face interaction.

Usability evaluation of mobile applications is of high importance in order to discover, early enough, the main problems that users may encounter while they are immersed in these environments. Traditional usability evaluation methods used for desktop software cannot be directly applied in these cases since many new aspects need to be taken in consideration, related to mobility and group interaction. Therefore, there is a need either to adapt the existing methods in order to achieve effective usability evaluation of mobile applications or to create new ones. An important issue, that is discussed here, is the *process* and *media* used for recording user behaviour.

Data collection during usability studies is a particularly important issue as many different sources of data may be used. Among them, *video and audio* recordings are invaluable sources for capturing the context of the activity including the users' communication and interaction. It has been reported that in cases of studies that audio and video recordings were lacking, it was not possible to explain why certain behaviour was observed (Jambon, 2006). Recording user behaviour is a delicate process. Video and audio recording must be as unobtrusive as possible in order not to influence the behaviour of the subjects while, on the other hand, the consent of the users for their recording should be always obtained. In addition, questions related to the frame of the recorded scene, viewing angle, and movement of the camera are significant. It must be stressed that there is a trade off between capturing the interaction with a specific device and capturing the overall scene of the activity. For example, often, crucial details may be missing from a video if recording the scene from a distance. Therefore, this video has to be complemented by other sources of related information, like screen captures of the devices used.

In order to conduct a successful usability evaluation, apart from collecting activity data, techniques and tools are needed for analysis of the collected information. In the last years, new usability evaluation techniques have emerged, suitable for mobile applications. Many of these methods focus mainly on user interaction with the mobile device, missing interaction between users, and user interaction with the surrounding environment.

Taking into consideration these aspects, the aim of this chapter is to discuss techniques and tools used first, for collecting data during usability evaluation studies of mobile devices, and then for the analysis of these data. In the process, a combination of a screen capturing technique and some tools that can be used for analysis of data of usability studies are presented.

BACKGROUND

The usability of a product has been traditionally related with the ease of use and learn to use, as well as with supporting users during their interaction with the product (Dix, Finley, Abowd, & Beale, 2003; Schneiderman & Plaisant, 2004). There have been many attempts to decompose further the term and render it operational through attributes and apt metrics. According to ISO 9241-