Chapter LVII
Did You See That?

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ABSTRACT

The development of appropriate lab-based evaluation techniques for mobile technologies requires continued research attention. In particular, experimental design needs to account for the environmental context in which such technologies will ultimately be used. This requires, in part, that relevant environmental distractions be incorporated into evaluations. This chapter reflects on different techniques that were used in three separate lab-based mobile evaluation experiments to present visual distractions to participants and to measure the participants’ cognizance of the distractions during the course of mobile evaluations of technology. The different techniques met the different needs of the three studies with respect to the fidelity of the data captured, the impact of acknowledging distractions on the evaluation task, and the typical context of use for the technology being evaluated. The results of the studies showed that the introduction of visual distractions did have an impact on the experimental task and indicate that future work is required in this area.

INTRODUCTION

Recent research has demonstrated the effect of mobility on users’ task performance when using mobile technologies (e.g., Brewster, 2002; Brewster, Lumsden, Bell, Hall, & Tasker, 2003; Crossan, Murray-Smith, Brewster, Kelly, & Musizza, 2005; Mizobuchi, Chignell, & Newton, 2005; Mustonen, Olkkonen, & Hakkinen, 2004). These studies reflect an increasing recognition of the need to assess the usability of mobile technologies and applications under mobile conditions. In this respect, studies like these demonstrate a significant advancement on previous static evaluations of mobile technologies which highlighted cosmetic usability issues (Kjeldskov & Stage, 2004) but failed to uncover usability issues arising as a result of the environmental and physical context in which the technologies would ultimately be used. That said, with minor exceptions, these studies do not
adequately incorporate the environmental context of use. Indeed, as noted by Brewster (2002), further research is required to develop appropriate evaluation techniques for the evaluation of mobile devices in realistic situations.

Although one might argue that realistic usability evaluations are only achievable in the field, a recent investigation has shown that there is little or no benefit to undertaking evaluations in the field as opposed to in the lab (Kjeldskov, Skov, Als, & Høegh, 2004). Not only have lab-based mobile evaluations of mobile technologies been found to identify more usability problems (including context-specific problems) than field-based studies, but also the lab environment allows for far greater experimental control and easier data capture than is possible in the field (e.g., Goodman, Brewster, & Gray, 2004; Kjeldskov et al., 2004; Kjeldskov & Stage, 2004). That is not to say that field-based evaluations do not have a significant role to play; rather, they are perhaps more suited to later-stage high-level usability evaluations once the majority of usability defects have been eliminated via a process of controlled experimentation.

Having concluded that lab-based studies are a viable means by which to assess the usability of mobile technologies, to meaningfully evaluate the suitability of the technologies for a given usage scenario, it is essential that the lab set-up adequately reflect the intended context of use of the technology. Perhaps one of the most obvious contextual constraints imposed on mobile technology by the environment in which it is used is the requirement for a user to be visually cognizant of his or her physical surroundings while using the technology. Although the nature of environmental surroundings and the consequence of failing to remain cognizant of such surroundings will obviously differ from scenario to scenario, this constraint typically means that users cannot devote all of their visual resources to the technology with which they are interacting. This chapter reflects on different techniques that were used in three separate lab-based experiments to present visual distractions to users and to measure the users' cognizance of the distractions during the course of mobile evaluations of technology. The experiments were all part of an ongoing research effort to develop contextually-relevant experimental techniques for lab-based mobile usability and suitability evaluations. We are simultaneously investigating the use of other sensory distractions and mechanisms of mobility in order to support comprehensive lab-based studies, but this work is outside the scope of this chapter.

In the following sections, each of the three experimental set-ups is outlined and our observations as to the effectiveness of each in terms of the inclusion of visual distractions are discussed. Our aim is to contribute to an emerging body of knowledge related to achieving meaningful and effective lab-based mobile evaluations. We hope that the reflection on our experience will help guide researchers and/or at least provoke discussion on the issue and, to this end, this chapter closes with some high-level conclusions from our observations.

CLASSIFYING DISTRACTIONS

There are numerous types of distractions affecting different senses that can influence the use of mobile technology. For the purpose of discussion, we classify such distractions as follows:

- **Passive distractions**: These distract users but require no active response
- **Active distractions**: These require a user to respond or react in some way (the required response varying according to the nature of the distraction)
- **Interfering distractions**: These may be passive or active and they interfere with a user’s ability to effectively interact with a mobile device

Notably, any given environmental distraction can fit differently into this classification scheme depending on the given context of use. In a lab-based environment, however, the nature and extent of distractions can be controlled to enable an evaluator to focus on, and measure of the effect of, specific distractions on users’ ability to
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