Chapter 4.10
Using Mobile Phones and PDAs in Ad Hoc Audience Response Systems

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ABSTRACT

This chapter investigates how to create ad hoc audience response systems using nonspecialist devices. The chapter revolves around two case studies: one involving the use of mobile phones, and the other based on PDAs. Both case studies are carried out in tertiary education institutions, showing how these devices can be used to facilitate audience participation using devices that students might, themselves, bring to lectures. Both are evaluated from the perspective of the student and the educator, using a mixture of observational and interview-based techniques.

INTRODUCTION

Anyone who has given a talk or lecture to a large audience will be well acquainted with the uncomfortable silences, embarrassed glances, and nervous shuffling that greet requests for audience participation. This anecdotal evidence is supported by survey findings presented by Draper and Brown (2004), indicating that if a lecture class is asked for a verbal response, 0% to 3.7% of students are likely to respond: even for the less exposing, "hands-up" response style, the participation rate might also be a low 0.5%-7.8%.

Not all audiences are so shy, though. In the late 1990s, the television game show, "Who Wants to

Be a Millionaire?" attracted large, viewing numbers throughout the world. As part of the game format, the contestant could "ask the audience," getting each member to answer the multichoice question using a handset.

Draper and Brown have taken similar handsets out of the TV studio and into the classroom. In Draper and Brown (2004), and an earlier paper (Draper, Cargill, 2002), they present pedagogic motivations for their work, which we share, and will not elaborate on here, beyond noting the value of interactivity and engagement between the learners (students) and the learning-leader (lecturer).

In a long-term, extensive study, summarized in Draper and Brown (2004), the personal response system they used for multiple-choice questions (MCQs) was seen as being of benefit: for example, 60% of 138 first-year computer students rated the system "extremely" or "very" useful; and, similar responses were seen in other disciplines as varied as medicine and philosophy. Handsets are also likely to increase the participation levels: when asked whether they would work out an answer if asked to vote using the system, between 32%-40% agreed.

Of course, specialized handsets have many advantages such as providing simple, direct ways for students to respond (they just press a button): however, there are some drawbacks, including large costs involved in providing handsets ubiquitously, for every student and every lecture; organizational-overheads (e.g., handing out and collecting handsets); and, the impoverished range of responses possible (a single selection for MCQ use).

Inspired by Draper and Brown's experiences, we sought to address these sorts of drawbacks by using a technology that most students now carry with them to every lecture — the mobile telephone. We were interested in whether the pervasiveness and easy familiarity students have with this technology would allow it to serve as a replacement for the purpose-built handsets. Furthermore, we

wanted to explore the possibilities beyond MCQs such as students sending free-text questions or, perhaps suggestions and comments to the lecturer. Although other researchers have considered the use of mobile phones in a university setting, for example (Cheverst et al., 2003), we believe this to be a novel application.

Mobile phones are becoming increasingly sophisticated, with a number of current models, sometimes termed "smartphones," providing the sorts of functionality, such as web browsing and document editing, and wireless connectivity, like Wi-Fi and Bluetooth, as well as conventional mobile telecom networking, seen on the hand-held personal digital assistants (PDAs). In light of these technological advances, we developed MISPE — the mobile information sharing in the presentation environment, to explore future interaction possibilities for audiences.

The use of personal technologies, like advanced mobile phones and PDAs, has the potential to help all students play a more active role in their education experiences. For people in developing countries though, for example those in South Africa or India, the mobile is a "bridging technology" that can span the digital divide (Marsden, 2003). In these contexts, access to traditional information technology is limited: meanwhile, in South Africa, for instance, over 40% of the population owns a cell phone (rising to 70% for Europe). Staggeringly, over one billion people worldwide own a GSM handset!

In this chapter, we present our experiences in terms of two case studies: the first involves the use of mobile phones to enable the audience to give real-time feedback and responses; the second considers the role of an ad hoc network consisting of the audience's personal technologies, and the lecturer's computer, using MISPE. We discuss both technology issues such as infrastructure requirements and limitations, as well as others relating to the users' experience.

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