Chapter 6
Experiences of Supporting Local and Remote Mobile Phone Interaction in Situated Public Display Deployments

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ABSTRACT
Public displays and mobile phones are ubiquitous technologies that are already weaving themselves into the everyday life of urban citizens. The combination of the two enables new and novel possibilities, such as interaction with displays that are not physically accessible, extending screen real estate for mobile phones or transferring user content to and from public displays. However, current usability evaluations of prototype systems have explored only a small part of this design space, as usage of such systems is deeply embedded in and dependent on social and everyday context. In order to investigate issues surrounding appropriation and real use in social context field studies are necessary. In this paper

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we present our experiences with field deployments in a continuum between exploratory prototypes and technology probes. We present benefits and drawbacks of different evaluation methods, and provide a number of validated lessons from our deployments.

INTRODUCTION

The use of mobile phones provides a range of new and novel opportunities for supporting interaction with public displays. Furthermore, such interaction can help overcome some of the problems associated with interactions with public displays. An example is the potential inability of users to interact with a touch screen display because of its physical placement (e.g., inappropriate height for a wheelchair user). Mobile phones can also support multi-user interaction and act as a means of transferring content to a public display or display content to the user’s device. While these issues have been investigated in lab studies it is not clear how they will be appropriated in everyday life. In this article we discuss our explorations of some of these issues and present a number of lessons as a result. The lessons are based on our experiences with supporting both local and remote mobile phone interaction with a number of situated display deployments. Our research approach involves a tight cycle where theoretical issues and understanding, developed through reflection on empirical observations, are used to design deployed systems that test and explore theories. These deployed systems then create a new context for observation of user behaviour and thus lead to fresh insights, discoveries and refinement of theoretical understanding.

RELATED WORK

There is surprisingly little published work relating to the combination of mobile phones and situated public displays, and the vast majority of these systems have only been evaluated in the lab, if at all. ContentCascade (Himanshu, Gossweiler, & Milojicic, 2004) for example enables a user to download content from a public display onto her mobile phone using Bluetooth. The system was tested in a small and informal user study using movie clips. More recent work by Maunder, Marsden and Harper (2007) has investigated the potential for supporting mobile phone interaction with public displays in order to enable users to select and download content without requiring the user to keep their phone in a discoverable state. Their approach required the user to take a picture of the content screen that he/she wishes to download and then send this picture back to the public display server as a Bluetooth transfer, thus providing the server with the user’s phone’s Bluetooth MAC address. The server then performs image recognition to determine the content required by the user, which is then transferred via Bluetooth to the user’s phone. The system has only been evaluated informally. Ballagas, Rohs, Sheridan and Borchers (2005) present a survey of interaction techniques with mobile phones, most of which are used to generate input to a public display. The majority of systems they present have been evaluated only in lab studies. Rukzio, Boll, Leichtenstern and Schmidt (2007) present a comparison of different interaction techniques with mobile phones, which have been evaluated in the lab. Some systems use Bluetooth as a means to detect the presence of people rather than as a means to enable explicit interaction. Two examples of these systems are the BluScreen system (Payne, David, Jennings, & Sharifi, 2006), which links advertisement displays, agents bidding for advertisement space and the detection of presence via Bluetooth, and CityWare (Kindberg & Jones,
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