

# Usability in Mobile Interface Browsing

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## Abstract

*The advent of mobile devices imposes great challenges for user-friendly displays for effective browsing for Web contents. This paper reports some initial findings in an empirical study that explores the problem of finding a highly-efficient, user-friendly interface design method on small display devices. We compare three models using our PDA interface simulator: presentation optimization method, semantic conversion method, and zooming method. A controlled experiment has been carried out to identify the pros and cons of each method. The results show that of the three interface methods, the zooming method is slightly better than the semantic conversion method, while they both outperform the optimizing presentation method. The results provide a useful guidance for future design of small display devices.*

**Keywords:** mobile devices, Web browsing, user interface, empirical study, usability, PDA

## 1. Introduction

With the rapid advance of the Internet and mobile technology, an increasing number of people use wireless devices such as Web-enabled cell phones and PDAs (Personal Digital Assistants) to go online. The emergence of mobile devices and wireless networks has opened up new business opportunities known as *mobile commerce* (m-commerce). The design of mobile devices needs to address the requirements of mobility, limited input and output capabilities, multitasking and adaptive to a dispersed and widespread population. On the other hand, the technologies of mobile computing and Web intelligence have provided more opportunities to develop effective and efficient applications, such as Web browsers for clients. These technologies include *ad hoc* connectivity, location-aware services, and the capability to adaptively receive information and conduct transactions anywhere, at any time and in real time environments.

There are significant differences between a desktop computer screen and a small display. First, a small display device has a limited number of input facilities, processor power, memory and bandwidth [1]. The display form also introduces several new constraints for human computer interaction design. Second, there are various kinds of viewing conditions when surfing the Internet, such as varying screen sizes, style preferences, and different device capabilities [2]. For example, consider the case of a user viewing a diagram representing an organizational structure on the Web, the fully expanded diagram is of considerable complexity and may be unsuitable for small displays. Thus, if the diagram is to be viewed on the screen of a mobile device such as PDA, the original layout may not be appropriate. Furthermore, the interface of a small display device is less sophisticated. The standard components of traditional graphical user interfaces, such as scrollbars, buttons and menus, which on a desktop only take a small percentage of the available screen estate, take up a considerable percentage of screen estate on a PDA.