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Chapter II

Wireless Devices for Mobile Commerce: User Interface Design and Usability

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ABSTRACT

Well-designed and usable interfaces for mobile commerce applications are critical. But given the uniqueness of the wireless environment, usability becomes even harder to ensure. This chapter describes the benefits and limitations of various wireless device interface technologies. It provides guidance on determining the usability of wireless devices, emphasizing the fact that context will factor heavily into the use of mobile applications. Some of the additional challenges that developers face when designing applications for wireless devices, such as infrastructure and software issues, are also discussed.

INTRODUCTION

An increasing number of technologies and applications have begun to focus on mobile computing and the wireless Web. *Mobile commerce* (m-commerce) encompasses all activities related to a (potential) commercial transaction conducted through communications networks that interface with wireless (or mobile) devices (Tarasewich, Nickerson, and Warkentin, 2001). Ultimately, researchers and developers must determine what tasks users really want to perform anytime from

anywhere and decide how to ensure that information and functionality to support those tasks are readily available and easily accessible.

A well-designed and usable interface to any application is critical. For example, properly designed Websites help ensure that users can find information that they are looking for, perform transactions, spend time at the site, and return again. Given the uniqueness of the wireless environment, usability becomes even harder to ensure for m-commerce applications. The purpose of this chapter is to provide the reader with an overview of current wireless device interface technologies. It will provide guidance on designing usable m-commerce applications that take advantage of the benefits and respect the limitations of these devices. This chapter will also explore the interface design and usability challenges that the m-commerce environment still presents for users, researchers, and developers.

This chapter is organized as follows. The first section describes the benefits and limitations of various wireless device interfaces. The next section looks at how the usability of wireless devices affects the feasibility and success of m-commerce applications. The third section discusses some of the additional challenges that developers face when designing applications for wireless devices. The final section reiterates the need for good wireless application design, and describes some of the safety and security issues related to wireless device interface design.

WIRELESS DEVICES AND THEIR INTERFACES

The devices currently most important to m-commerce can be classified according to the categories listed in Table 1. There is some feeling that devices will become completely generic, and take the place of items like televisions, pagers, radios, and telephones (Dertouzos, 1999), but the question remains as to what form the devices will ultimately take. This important issue will be investigated further in the section on mobile system developer issues later in the chapter. But first we look at the current interfaces of these devices, their strengths, and their limitations. The discussion is separated into input and output interactions. Research that has been

Table 1: Wireless Device Categories

Laptop Computer
Handheld (e.g., Palm, Pocket PC, Blackberry)
Telephone
Hybrid (e.g., "smartphone" PDA/telephone combination)
Wearable (e.g., jewelry, watches, clothing)
Vehicle Mounted (in automobiles, boats, and airplanes)
Specialty (e.g., the now defunct Modo)