Chapter III
Mobile Handheld Devices

INTRODUCTION

Mobile users interact with mobile commerce applications by using small wireless Internet-enabled devices, which come with several aliases such as handhelds, palms, PDAs, pocket PCs, and smartphones. To avoid any ambiguity, a general term, mobile handheld devices, is used in this book. A mobile handheld device is small enough to be held in one hand and is a general-purpose, programmable, battery-powered computer, but it is different from a desktop PC or notebook due to the following three special features:

- **Limited network bandwidth**: This limitation prevents the display of most multimedia on a microbrowser. Though the Wi-Fi and 3G networks go some way toward addressing this problem, the wireless bandwidth is always far below the bandwidth of wired networks.
- **Small screen/body size**: This feature restricts most handheld devices to using a stylus for input.
- **Mobility**: The high mobility of handheld devices is an obvious feature that separates handheld devices from PCs. This feature also makes possible many
new applications such as mobile recommendations that normally cannot be done by PCs.

Short battery life and limited memory, processing power, and functionality are additional features that impose limitations on handheld devices, but these problems are gradually being solved as the technologies improve and new methods are constantly being introduced. Figure 3.1 shows a typical system structure for handheld devices, which includes six major components: (i) a mobile operating system, (ii) a mobile central processing unit, (iii) a microbrowser, (iv) input and output devices and methods, (v) memory and storage, and (vi) batteries. Brief descriptions of each of these components are given below, followed by a more detailed description in the main body of the chapter.

1. **Mobile operating systems**: These comprise the core software of handheld devices. Mobile operating systems are different from those in desktop computers as they include the following additional features: (i) power management to prolong the battery life, (ii) real-time capability for time-critical operations such as voice communication, and (iii) a wireless infrastructure for wireless communication.

2. **Mobile central processing units**: Mobile CPUs are the core hardware of mobile handheld devices, and the performance and functionality of the devices are heavily dependent on the capabilities of the processors.
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