Chapter 2.14
Handheld Computing and Palm OS Programming for Mobile Commerce

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INTRODUCTION

It is widely acknowledged that mobile commerce is a field of enormous potential. However, it is also commonly admitted that the development in this field is constrained. There are still considerable barriers waiting to be overcome. One of the barriers is most software engineers are not familiar with handheld programming, which is the programming for handheld devices such as smart cellular phones and PDAs (personal digital assistants). This article gives a study of handheld computing to help software engineers better understand this subject. It includes three major topics:

- **Mobile commerce systems:** The system structure includes six components: (1) mobile commerce applications, (2) mobile handheld devices, (3) mobile middleware, (4) wireless networks, (5) wired networks, and (6) host computers.
- **Handheld computing:** It includes two kinds of computing: client- and server-side handheld computing.
- **Palm OS programming:** The Palm OS Developer Suite is used to develop applications for palm devices by handheld programmers.

This article focuses on Palm OS programming by giving a step-by-step procedure of a palm application development. Other client-side handheld computing is also discussed.

BACKGROUND

With the introduction of the World Wide Web, electronic commerce has revolutionized traditional commerce and boosted sales and exchanges of merchandise and information. Recently, the emergence of wireless and mobile networks has made possible the extension of electronic commerce to a new application and research area: *mobile commerce*, which is defined as the exchange or buying and selling of commodities, services, or information on the Internet through the use of mobile handheld devices. In just a few years, mobile commerce has emerged from nowhere to become the hottest new trend in business transactions. To explain how the mobile commerce components work together, Figure 1 shows a flowchart of how a user request is processed by the components in a mobile commerce system, along with brief descriptions of how each component processes the request (Hu, Lee, & Yeh, 2004).

1. **Mobile commerce applications:** Electronic commerce applications are numerous, including auctions, banking, marketplaces and exchanges, news, recruiting, and retailing to name but a few. Mobile commerce applications not only cover the electronic commerce applications, but also include new applications, which can be performed at any time and from anywhere by using mobile computing technology, for example, mobile inventory tracking.

2. **Mobile handheld devices:** An Internet-enabled mobile handheld device is a small general-purpose, programmable, battery-powered computer that is capable of handling the front end of mobile commerce applications and can be operated comfortably while being held in one hand. It is the device with which mobile users interact directly with mobile commerce applications (Hu, Yeh, Chu, Chu, Lee, & Lee, 2005).

3. **Mobile middleware:** The term middleware refers to the software layer between the operating system and the distributed applications that interact via the networks. The primary mission of a middleware layer is to hide the underlying networked environment's complexity by insulating applications from explicit protocols that handle disjoint

Figure 1. A flowchart of a user request processed in a mobile commerce system
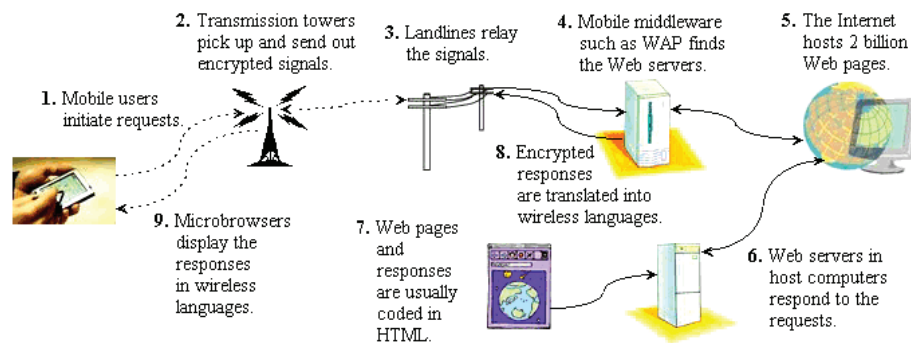
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