INTRODUCTION

There are two kinds of handheld computing and programming, namely client- and server-side handheld computing and programming. The most popular applications of the latter are used with database-driven mobile web content, whose construction steps were described in the previous section. The remainder of this book will be devoted to client-side handheld computing and programming, whose applications do not need the support of server-side programs. Client-side handheld applications are varied and numerous, covering a wide range of everyday activities. Popular application examples include:

- **address books**, which store personal information such as addresses, telephone numbers, and email addresses in an accessible format,
- **appointments**, which allow users to edit, save, and view times reserved for business meetings and visits to the doctor,
- **calculators**, which may be a standard 4-function pocket calculator or a multi-function scientific calculator,
• *datebooks/calendars*, which allow users to enter hourly activities and show a daily or weekly schedule, or a simple monthly view,
• *expenses*, which allow users to track and record common business expenses such as car mileage, per diems, air fees, and hotel bills,
• *mobile office functions*, which include viewing and processing documents, spreadsheets, presentations, and inventory.
• *multimedia*, which includes playing music and videos, photography, and personal albums.
• *note pads*, which allow users to save, view, and edit text notes,
• *to-do lists*, which allow users to enter a list of tasks to be performed, and
• *video games*, in addition to those on-line video games that require the support of server-side programs.

**HANDHELD PROGRAMMING ENVIRONMENTS/LANGUAGES**

Various mobile programming environments/languages are applied to client-side handheld programming and computing. Handheld devices are inconvenient for handheld application development because of their small sizes and screens and awkward input methods, so handheld application programmers generally develop software with the aid of handheld emulators, which run on regular PCs and laptops but are configured to accept the same inputs and produce the same outputs as the handheld device being modeled. Once the applications are fully developed and tested, they are then synchronized to the actual devices. Figure 10.1 shows a generic development cycle for client-side handheld applications. Several popular mobile programming environments/languages for client-side handheld computing and programming are listed below:

*Figure 10.1. A generic development cycle for client-side handheld applications*

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Design and Development of Internet of Things-Based Wireless Health Monitoring System