

Mobile Internet and Handheld Devices for Virtual Communities

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INTRODUCTION

With the introduction of the Internet, virtual communities have revolutionized traditional communities and boosted sharing and exchanges of information, and common interests, ideas, and feelings. Recently, the emergence of wireless and mobile networks has made possible the admission of the Internet accessed by desktop or notebook computers to the mobile Internet accessed by handheld devices, which has brought great impact on virtual communities. Figure 1 shows the growth in demand for handheld computing devices (not including smart cellular phones) through 2007, as predicted by the research firm In-Stat/MDR (PalmInfocenter.com, 2003). The mobile Internet has introduced new virtual communities and has the existing communities reach new members or topics because it allows the community members to communicate with each other from anywhere and at anytime.

This article discusses the mobile technologies, especially the mobile Internet and handheld devices, for virtual communities and their influence on the communities. Three themes of this discussion are as follows:

1. **The mobile Internet:** It is a part of the Internet whose contents are specifically designed for mobile users who use handheld devices such as smart cellular phone to access the mobile contents. The following topics related to the mobile Internet will be discussed: (1) mobile applications, (2) mobile handheld devices, (3) mobile middleware, (4) wireless and wired networks, and (5) host computers.
2. **Internet-enabled mobile handheld devices:** They are small general-purpose, programmable, battery-powered computers such as PDAs (personal digital assistants) and smart cellular phones. The following components of handheld devices will be examined: (1) mobile operating systems, (2) mobile central processing units, (3) microbrowsers, (4) input/output devices, (5) memory, and (6) batteries.

3. **The virtual communities using mobile technologies:** Many traditional virtual communities have been greatly affected by mobile technologies because they allow the community members to communicate with each other from anywhere and at anytime. This boosts sharing and exchanges of information, and common interests, ideas, and feelings.

BACKGROUND

This section provides background information of the three themes of this article: (1) the mobile Internet, (2) Internet-enabled mobile handheld devices, and (3) the virtual communities using mobile technologies.

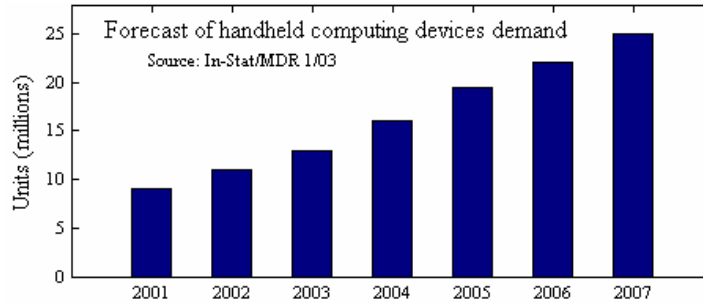
The Mobile Internet

The convergence of mobile technologies and the Internet has brought the mobile Internet to the general public. The conventional Internet is designed for the accesses from the desktop or notebook computers, whereas the contents of mobile Internet are specifically designed for the mobile users who use Internet-enabled mobile handheld devices such as smart cellular phones to access the mobile Internet (Goodman, 2000). The mobile Internet includes five major topics: (1) mobile applications, (2) mobile handheld devices, (3) mobile middleware, (4) wireless and wired networks, and (5) host computers, which will be discussed later.

Internet-Enabled Mobile Handheld Devices

Virtual-community users interact with other users by using small wireless Internet-enabled devices, which come with several aliases such as handhelds, palms, PDAs,

Figure 1. Forecast of demand for mobile handheld computing devices



pocket PCs, and smart phones. They are small general-purpose, programmable, battery-powered computers, but the handheld devices are different from desktop PCs or notebooks due to the following special features:

- Limited network bandwidth
- Small screen/body size
- Mobility

Short battery life and limited memory, processing power, and functionality are additional features, but these problems are gradually being solved as the technologies improve and new methods are constantly being introduced. The limited network bandwidth 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. The small screen/body size restricts most handheld devices to using a stylus for input.

Virtual Communities Using Mobile Technologies

A virtual community is a collection of people sharing common interests, ideas, and feelings over the Internet or

other collaborative networks (Rheingold, 1993). Traditional communities use desktop or notebook computers for communication. The virtual communities discussed in this article are the ones where members heavily use the mobile Internet and Internet-enabled mobile handheld devices for communication.

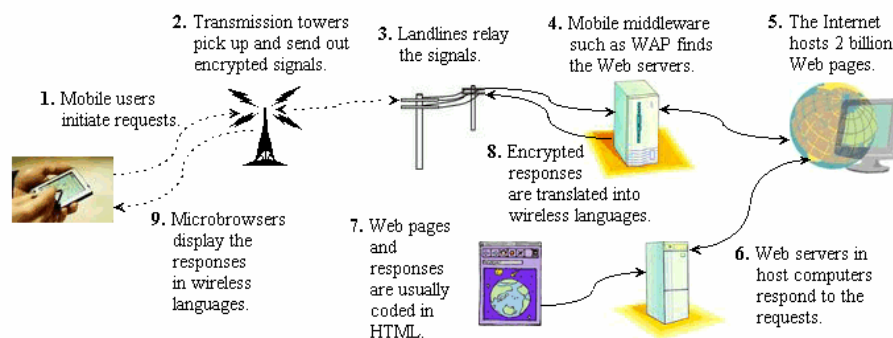
MAIN THRUST

This section details the three themes of this article: (1) the mobile Internet, (2) mobile handheld devices, and (3) the virtual communities using mobile technologies.

The Mobile Internet

To explain how the mobile Internet works for the virtual-community users, Figure 2 shows a flow chart of how a virtual-community user's request is processed by the mobile Internet. The mobile Internet includes five major topics: (1) mobile applications, (2) mobile handheld devices, (3) mobile middleware, (4) wireless and wired networks, and (5) host computers. A brief introduction of each topic is given below.

Figure 2. A flow chart of virtual-community user's request processed in the mobile Internet



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