In the next few years, we are likely to see dramatically improved wireless communication technologies and small handheld access devices (HADs) such as Internet-enabled cellphones and personal digital assistants (PDAs). These converging trends open new possibilities for electronic commerce. These new possibilities often are discussed under the banner of m-commerce or mobile electronic commerce. This chapter looks at device trends, wireless communication trends, potential applications and potential problems in m-commerce.

INTRODUCTION

When people visit e-commerce sites or intranet servers today, they normally use desktop computers or notebook computers. Both machines are very large. Someone once suggested that the desktop computer received its name because it takes up your entire desktop. Notebook computers are smaller but still give travelers “jet lug.” Neither has the convenience of a wallet or a purse.

Another problem for e-commerce and intranets is that most users need a wired connection, whether it is a telephone line, a digital subscriber line (DSL), a cable television system or a LAN. Although notebooks are physically portable, connecting them to networks is another matter. Notebook users usually have to find a telephone jack to connect to the Internet. When consumers want to buy and when intranet users want to reach their servers, they often have no way of doing so.

Handheld Access Devices (HADs)

Things are likely to change dramatically in the future, thanks to a trend known as m-commerce or mobile electronic commerce. This new form of e-commerce has two major thrusts. The first is the creation of new handheld access devices (HADs) that will be much smaller and simpler than today’s PCs.

This chapter appears in the book, Managing Internet and Intranet Technologies in Organizations: Challenges and Opportunities by Subhasish Dasgupta. Copyright 2001, Idea Group Inc.
Today, the charge toward truly portable devices is being led by intelligent cellphones and by slightly larger personal digital assistants (PDAs) such as the Palm Pilot. However, in the future we will also see devices with new form factors (shapes and sizes). We will have clipboard HADs, HADs using our televisions as displays, wristwatch and bracelet HADs, wallet HADs, wearable HADs with eye screens and even automobile HADs with heads-up displays resembling those in fighter jets.

Future access devices, furthermore, should not be judged by the processing limitations of today’s cellphones and PDAs. Moore’s Law, which suggests that processing power for a given price doubles every 12 to 24 months, means that even HADs the sizes of cellphones and PDAs soon will be as powerful as today’s desktop PCs.

At the same time, very fast processing speeds, large memories and bright displays require a great deal of electrical power. HAD designs will always have to balance capabilities against battery life. Still, as the speed of low-power components continues to increase, even HADs with considerable battery lives will reach the levels of today’s desktop computers fairly soon.

One way to leverage the processing power of HADs is to use them as thin clients, putting most processing power on application servers. However, thin clients can place heavy burdens on network transmission systems. As discussed below, speed is growing but high-speed service is likely to be expensive, and radio frequency spectrum will continue to be somewhat limited, making its use for thin client support a policy issue.

**Wireless Access**

The other major thrust of m-commerce is wireless access, so that users will not need a physical access line to reach an e-commerce site or an intranet server. Internet access for cellphones and PDAs is already here, but speeds are limited, costs are high and there are incompatible competing services. Tomorrow’s wireless access networks will be faster, more affordable and hopefully more standardized.

**The Future Is Now**

Although the idea of wireless devices that can connect us to e-commerce and intranets anytime and anywhere may sound futuristic, it is not. Cellphones are already very widespread. In 2000, the number of cellphones in Japan exceeded the number of fixed telephones (Reuters, 2000). Cellphones will also pass the number of wired phones in other countries soon, especially in Europe. The Cahners In-Stat Group predicts that there will be a billion wireless phone users in 2002. Gartner believes that this number will be reached in 2003.

In addition, cellphones will be widely used for Internet access. Part of the reason for cellular’s popularity in Japan is NTT’s DoCoMo i-mode system for always-on Internet access. The Yankee group predicts that 30% of all cellphones sold in the US in 2000 will be Internet-capable. According to the International Data Corporation, almost all new cellphones will be Internet-capable in 2001, and by the end of 2002, there will be many more wireless devices accessing the Internet than
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