Chapter 3.38
Mobile and Electronic Commerce Systems and Technologies

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ABSTRACT

The emergence of wireless and mobile networks has made possible the introduction of electronic commerce to a new application and research subject: mobile commerce. Understanding or constructing a mobile or an electronic commerce system is an arduous task because the system involves a wide variety of disciplines and technologies and the technologies are constantly changing. To facilitate understanding and constructing such a system, this article divides the system into six components: (i) applications, (ii) client computers or devices, (iii) mobile middleware, (iv) wireless networks, (v) wired networks, and (vi) host computers. Elements in these components specifically related to the subject are described in detail and lists of current technologies for component construction are discussed. Another important and complicated issue related to the subject is the mobile or electronic commerce application programming. It includes two types of programming: client-side and server-side programming, which will be introduced too.

INTRODUCTION

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. The future of mobile commerce is bright according to the following predictions:

- Figure 1 shows the growth in demand for smart mobile devices including handhelds, wireless handhelds, and smart cellular phones through 2006, as estimated by the research firm Canalys (2004a, 2004b, 2004c, 2005a, 2005b, 2005c, 2005d, & 2006).
- Cumulative sales of smartphones will reach 1 billion units by the first quarter of 2011 according to IDC, a market research company (Symbian Limited, 2006).

- According to various reports, the estimated worldwide shipments of the following three equipments in 2006 were:
  - *PDAs and smartphones*: 84 million (Gartner, Inc., 2006);
  - *Celular phones*: 986 million (cellular-news, 2006); and
  - *PCs*: 250 million (Silicon Valley Daily, 2006).

The worldwide shipments of PDAs and smartphones in 2006 had a 57% increase from the same period last year, according to Gartner, Inc. Smartphone shipments bolstered the market growing 75.5% to reach 34.7 million units, more than four times the size of the PDA market. PDA shipments increased by 5.7% totaling 7.4 million units. Though the unit sales were less than one tenth of the worldwide mobile phone sales in 2006, they were not too far away from the worldwide PC sales in 2006.

- Juniper Research has published a report forecasting that the global mobile commerce market will be an $88 billion industry by 2009 (Glenbrook Partners, LLC., 2004) compared to $8.5 trillion of business-to-business electronic commerce in 2005 (Gartner, Inc. 2001).

Figure 1. Worldwide total smart mobile device market
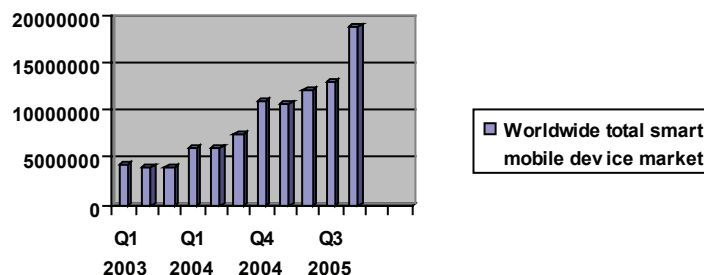
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