Chapter 1.3
Mobile Electronic Commerce

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INTRODUCTION

Mobile electronic commerce (or m-commerce) is generally defined as the set of financial transactions that can be carried out over a wireless mobile network (Pierre, 2003; Varshney, 2001; Varshney, Vetter, & Kalakota, 2000). According to this definition, m-commerce constitutes a subset of all electronic commercial transactions (electronic commerce or e-commerce) from business-to-consumer (B2C) or business-to-business (B2B). Thus, short personal messages such as those from short messaging system (SMS) sent between two individuals do not fall within the category of m-commerce, whereas messages from a service provider to a salesperson or a consumer, or vice versa, do fit this very definition. M-commerce appears an emerging manifestation of Internet electronic commerce which meshes together concepts such as the Internet, mobile computing, and wireless telecommunications in order to provide an array of sophisticated services (m-services) to mobile users (Paurobally, Turner, & Jennings, 2003).

Before purchasing a product, clients need services such as those used to search for a product and a merchant who offer the lowest price for this product. Consumers also like to participate in auctions and analyze the quality/price ratio of a product for a certain number of suppliers (Jukic, Sharma, Jukic, & Parameswaran, 2002). Online shopping for a given product is becoming increasingly popular, and electronic purchasing and bargaining consist of looking up and deciphering the contents of electronic catalogues prior to making a decision. To automate this process and to ensure that these documents are comprehensible to computers, they must have a standard format. Such services exist in standard commerce; however, in e-commerce, they require further consideration such as those related to the market dynamics, the variety of platforms, and the languages used by various merchant sites (Itani, & Kayssi, 2003; Lenou, Glitho, & Pierre, 2003).

Just as in standard commerce, e-commerce includes an initial step wherein consumers search for products they wish to purchase by virtually visiting several merchants. Once the product is found, negotiation for this possible transaction can take place between the customer and the merchant. If an agreement is reached, the next step is the payment phase. At each step of the process, a number of problems arise, such as transaction security, confidence in the payment protocol, bandwidth limitations, quality of service, shipping delays, and so forth (Paurobally et al., 2003). The peak withdrawal periods have always presented a major challenge for certain types of distributed applications. The advent of m-commerce further highlights this problem. Indeed, in spite of rather optimistic predictions, m-commerce iss plagued by several handicaps which hinder its commercial development.

This article exposes some basic concepts, technology and applications related to mobile electronic commerce. The background and key technological requirements needed to deploy m-commerce services and applications are discussed, some prominent applications of m-commerce are summarized, future and emerging trends in m-commerce are outlined, and a conclusion of these topics are presented.

BACKGROUND AND RELATED WORK

E-commerce relies upon users' interventions to initiate a transaction and select the main steps of the process. Users' actions are based upon a succession of virtual decisions. Indeed, when shopping with a virtual catalogue, customers can select products that meet their needs, tastes, and respect their price range. Such decisions consistently require the users' input, thus costing them both time and money. These costs are even more exorbitant when a search is launched for an order that includes a variety of products from different providers that have different characteristics (price range, delivery dates, etc.).

Mobile commerce refers to an ability to carry out wireless commercial transactions using mobile applications in mobile devices. M-commerce applications can be as simple as an address-book synchronization or as complex as credit card transactions.

In standard commerce, negotiating a contract or a commercial transaction is a standard practice in purchasing or sales. An agreement between a customer and a merchant can involve various components (price, delivery, warranty, etc.). For example, a volume price can be negotiated (e.g., 20% off the purchase of 100 items or more), price can fluctuate according to the demand (flight and hotel room prices vary according to seasons), and so forth. Once the client has obtained the best offer possible for the product of interest, the negotiation comes to a close. Obviously, the result of such negotiation can vary from one merchant to another. By providing a machine with the appropriate strategies and algorithms, negotiation can be automated and taken over by a computer, hence the concept of electronic negotiation, or e-negotiation.

Significant growth of m-commerce cannot be expected until the required technology (such as SMS services, Bluetooth, WAP, or i-mode) is developed and deployed. Indeed, due to the widely available GSM wireless networks, the SMS service allows GSM users to send short messages of up to 160 characters. These messages are saved and sent within a few seconds, which makes them unsuitable for real-time applications. SMS can become increasingly more important with future improvements once they allow users to send longer messages, multiple messages at once and when they allow users to create mailing lists. Such features will make m-commerce much more accessible.

Bluetooth is a low-powered wireless standard that allows a certain level of communication between many devices. Currently, it is a global

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