Evolution of Mobile Commerce Applications

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INTRODUCTION

The tremendous growth in mobile communications has affected our lives significantly. The mobile phone is now pervasive and used in virtually every sector of human activity—private, business, and government. Its usage is not restricted to making basic phone calls; instead, digital content, products, and services are offered. Among them, mobile commerce (m-commerce) holds a very important and promising position.

M-commerce can be defined as: using mobile technology to access the Internet through a wireless device such as a cell phone or a PDA (Personal Digital Assistant), in order to sell or buy items (products or services), conduct a transaction, and perform supply-chain or demand-chain functions (Adams, 2001).

Within the context of the present study, we shall examine widespread used and emerging m-commerce services, from early ones (i.e., SMS [Short Message Service]) to innovative (i.e., mobile banking and specific products offered by known suppliers). We shall also investigate some important factors for the development of m-commerce, as well as some existing risks. Particular emphasis is given to the issue of collaboration among the key-players for developing standardization, interoperability, and security, and for obtaining market penetration.

M-COMMERCE SERVICES AND COMMERCIAL PRODUCTS

M-commerce products and services involve a range of main players, including Telcos (telecommunications service providers), mobile operators, mobile handset manufacturers, financial institutions, suppliers, payment service providers, and customers. Each party has its own interests (e.g., Telcos and mobile operators are interested not only in selling network airtime, but also in becoming value-added services providers offering additional functionality; banks consider the adaptation of their financial services to mobile distribution channels). However, successful cooperation of the involved parties is the key to the development of m-commerce.

Today's most profitable m-commerce applications concern entertainment (e.g., SMS, EMS [Enhanced Message Service], MMS [Multimedia Message Service], ring tones, games, wallpaper, voting, gambling, etc.). However, new interactive applications such as mobile shopping, reservations and bookings, ticket purchases via mobile phones (for train and bus travel, cinemas and theaters, car parking, etc.), m-cash micro purchases (for vending machines, tollbooths, etc.), mobile generation, assignment and tracking of orders, mobile banking, brokering, insurance, and business applications (e.g., accessing corporate data) have emerged and are expected to evolve and achieve significant market penetration in the future. In addition, future m-commerce users are likely to view certain goods and services not only as m-commerce products, but also in terms of situations such as being lost or having a car break down, where they will be willing to pay more for specific services (e.g., location awareness, etc.).

Mobile banking (m-banking) is the implementation of banking and trading transactions using an Internet-enabled wireless device (e.g., mobile phones, PDAs, handheld computers, etc.) without physical presentation at a bank branch. It includes services such as balance inquiry, bill payment, transfer of funds,

statement request, and so forth. However, there are some problems regarding future development and evolution of mobile banking services. Many consumers consider those services difficult to use and are not convinced about their safety, while financial institutions are probably waiting for a payoff from their earlier efforts to get people to bank using their personal computers and Internet connections (Charny, 2001). As a consequence, the growth of mobile banking has been relatively slow since the launch of the first m-banking products by European players in 1999 and 2000. Currently, the main objective of mobile banking is to be an additional channel with a marginal role in a broader multi-channel strategy. Nevertheless, these strategic purposes are expected to change with the development of new applications of the wireless communication market, especially in the financial sector.

Now we will examine some characteristic m-commerce products. Japan's NTT DoCoMo was the first mobile telephone service provider to offer m-commerce services by launching the i-mode service in 1999 (NTT DoCoMo, 2004, Ryan, 2000). Key i-mode features include always-on packet connections, NTT's billing users for microcharges on behalf of content providers, and user's open access to independent content sites.

T-Mobile has developed a suite of applications called Mobile Wallet and Ticketing in the City Guide (T-Mobile, 2003). The first is a mobile payment system designed for secure and comfortable shopping. T-Mobile customers in Germany already use this system via WAP (Wireless Application Protocol). The highlight of the service is that customers do not have to provide any sensitive data like payment or credit card information when they make mobile purchases. Instead, after logging-in using personal data such as name, address, and credit card or bank details, they receive a personal identification number (PIN). By entering this PIN, a user can make a purchase from participating retailers.

With the Ticketing in the City Guide application, T-Mobile demonstrates a special future mobile commerce scenario. Here, entrance tickets for events such as concerts or sporting events can be ordered using a UMTS (Universal Mobile Telecommunications System) handset and paid for via Mobile Wallet. The tickets are sent to the mobile telephone by SMS in the form of barcodes. The barcodes can be read using a scanner at the venue of the event and checked to confirm their validity; subsequently, a paper ticket can be printed using a connected printer.

Nokia offers mobile commerce solutions such as the Nokia Payment Solution and the Wallet applications (Nokia Press Releases, 2001). The first one networks consumers, merchants, financial institutions, content/service providers, and various clearing channels in order to enable the exchange of funds among these parties and to allow users to make online payments for digital content, goods, and services via the Internet, WAP, or SMS. It collects, manages, and clears payments initiated from mobile phones and other Web-enabled terminals through various payment methods like credit and debit cards, operator's pre-paid or post-paid systems, and a virtual purse, which is an integrated pre-paid account of Nokia's Payment Solution that can be used with specific applications (e.g., mobile games). The solution enables remote payments from mobile terminals (e.g., electronic bill payment and shopping, mobile games, ticketing, auctioning, music downloading, etc.) and local payments (e.g., vending machines, parking fees, etc.).

Wallet is a password-protected area in the phone where users can store personal information such as payment card details, user names, and passwords, and easily retrieve it to automatically fill in required fields while browsing on a mobile site.

FACTORS AND RISKS

The development of advanced m-commerce applications, in combination with the evolution of key infrastructure components such as always-on high-speed wireless data networks (e.g., 2.5G, 3G, etc.) and mobile phones with multi-functionality (e.g., built-in-camera, music player, etc.) is stimulating the growth of m-commerce. Other key drivers of m-commerce are ease-of-use, convenience, and anytime-anywhere availability. On the other hand, a customer's fear of fraud is a major barrier. The nature of m-commerce requires a degree of trust and cooperation among member nodes in networks that can be exploited by malicious entities to deny service, as well as collect confidential information and disseminate false information. Another obvious risk is loss or theft of mobile devices. Security, therefore, is absolutely necessary

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