Challenges in M–Commerce

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M-COMMERCE

E-commerce activity is growing exponentially, and it is revolutionizing the way that businesses are run. In Asia, there is now an explosion of mobile wireless services. The number of 3G users in Korea has surpassed 1 million while in Japan it has grown from 50,000 in 2001 to 2 million in 2003. Mobile e-commerce (m-commerce) makes business mobility a reality; mobile users can access the Internet at any time, from anywhere and from their shirt pockets/purses using ubiquitous inexpensive computing infrastructure. It is estimated that the m-commerce market will grow to over USD200 billion by 2005 (Abbott, 2002). There are many definitions of m-commerce. One definition consists of all or part of mobile wireless services ranging from mobile phone networks to wireless local area networks. However, the service provided by mobile phone systems has achieved huge success. Mobile phone users originate from all walks of life and include almost all age groups, from teenagers to retired people. It creates a new method of personal communication without location constraints. Instead of briefly describing all mobile wireless services, we will concentrate on the mobile phone and PDA related to mobile telecommunication. Hence, m-commerce is defined as electronic commerce carried out in handheld devices such as the mobile phone and PDA through a mobile telecommunication network.

E-commerce is characterized by e-marketplaces, online auction systems which act as the intermediary between buyers and sellers, whereas, m-commerce is personalized and ideal for access to location-based services. Many new business models have been established around the use of mobile devices. Mobile devices have the characteristics of: portability, low cost, more personalization, global positioning system (GPS), voice, and so forth. The new business models include micro payment and mobile payment, content distribution services and business services. Figure 1 illustrates m-commerce applications. Because of their existing customer base, technical expertise and familiarity with billing, mobile telephone operators are the natural candidates for the provision of mobile and micro payment services. Micro payment involves small purchases such as vending and other items. In other words, the mobile phone is used as an ATM card or debit card. Consumers can pay for purchases at convenience stores or buy train tickets using their mobile phones.

Content distribution services are concerned with real-time information, notification (e.g., bank overdraft), using positioning systems for intelligent distribution of personalized information by location; for example, selective advertising of locally available services and entertainment. Real-time information such as news, traffic reports, stock prices, and weather forecasts can be distributed to mobile phones via the Internet. The information is personalized to the user's interests. By using a positioning system, users can retrieve local information such as restaurants, traffic reports and shopping information. Content distribution services with a greater degree of personalization and localization can be effectively provided through a mobile portal. Localization means to supply information relevant to the current location of the user. Users' profile such as past behavior, situation and location should be taken into account for personalization and localized service provision. Notification can be sent to the mobile device too. Mobile network operators (MNOs) have a number of advantages over the other portal players (Tsalgatidou & Veijalainen, 2000). First, they have an existing customer relationship and can identify the location of the subscriber. Second, they have a billing relationship with the customers while the traditional portal does not. MNOs can act as a trusted third party and play a dominant role in m-commerce applications. In addition, the mobile phone has become a new personal entertainment medium. A wide range of entertainment services are available, which consist of online game playing, ring tones download, watching football video clips, live TV broadcasting, music download and so on. Unsurprisingly, adult mobile services and mobile gambling services are among the fast growing services. According to Juniper research, the total revenue from adult mobile services and

mobile gambling services could be worth US$1billion and US$15billion respectively by 2008 (Kwok, 2004). Law regulators have to stay ahead of the fast growing development.

Businesses also need to think across traditional boundaries in e-commerce. Interaction among businesses, consumers, and smart appliances creates a lot of new opportunities: first, appliance-to-appliance, that is, appliances interact with an automatic service scheduler; second, appliance-to-business can deliver smart appliance repair alerts; third, business-to-appliance can deliver remote activation of smart appliances. For instance, the built-in sensors in a car will inform the repair service which part is broken. M-commerce also has a great impact on business applications, especially for companies with remote staff. Extending the existing Enterprise Resource Planning (ERP) systems with mobile functionality will provide remote staff, such as sales personnel, with real-time corporate and management data. Time and location constraints are reduced and the capability of mobile employees is enhanced. The logistic related business also benefits from the use of mobile inventory management applications. One interesting application is "rolling inventory" (Varshney & Vetter, 2002). In this case, multiple trucks carry a large amount of inventory while on the move. Whenever a store needs certain items/goods, a nearby truck can be located and just-in-time delivery of goods can be performed. M-commerce offers tremendous potential for businesses to respond quickly in supply chains.

CHALLENGES IN M-COMMERCE

M-commerce has a number of inherent complexities as it embraces many emerging technologies: mobile wireless systems, mobile handheld devices, software, wireless protocols, and security (Ojanperä & Prasad, 2001). These technologies have rapid product cycles and quick obsolescence. M-commerce, which is more complex than e-commerce, faces a number of challenges see Figure 2. The challenges are:

(i) The delay in 3G mobile network operators (MNO) in implementing their systems infrastructure. The success of m-commerce in Japan changes the concept of "free" Internet to "paid" Internet. Users are willing to pay for the service. MNOs anticipate a huge profit in taking control of the backbone of m-commerce – the wireless infrastructure. In addition, MNOs also play a dominant position in providing m-commerce applications. This has created an unreasonably high expectation from the services. Big companies in Europe, such as Deutsche Telecom, France Télécom, Spain's Telefünica and the UK's Vodafone, spent an estimated USD125 billion to USD150 billion on 3G licenses (Garber, 2002). Many of them are burdened with high debts.

(ii) With the exception of Asia, there is a lack of interest in 3G mobile phone systems. The Western European market has reached saturation point, where mobile possession rate is close to 100% in some countries.

Figure 1. M-commerce applications

Mobile Network
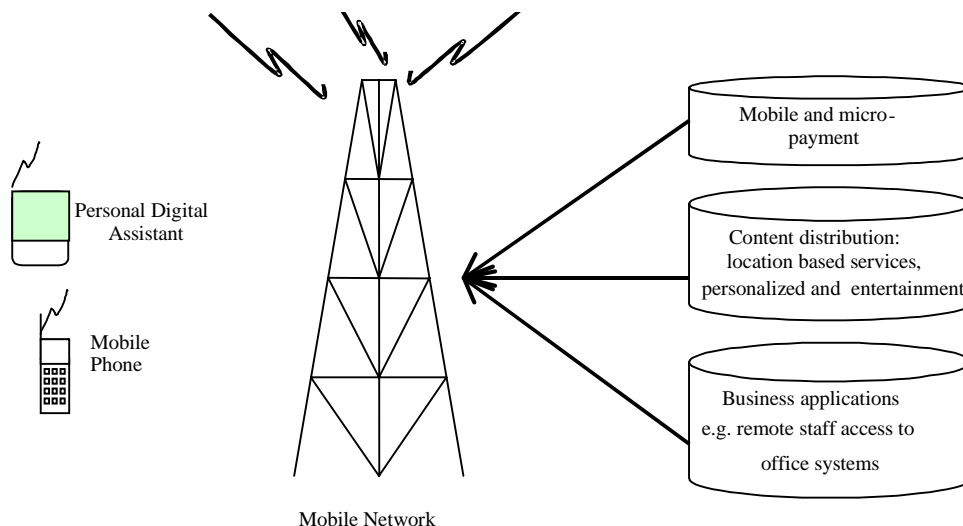
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