

Mobile Commerce and the Evolving Wireless Technologies

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INTRODUCTION

The mobile phone industry has experienced an explosive growth in recent years. The emerging markets such as China, India, and Brazil contribute this growth. In China, the number of mobile subscribers has already surpassed the number of fixed landline phone subscribers. In Korea and Japan, there is an explosion of mobile and wireless services. The United States are joining too and there were 207.9 million subscribers in 2005 (CTIA, 2006). Mobile e-commerce (m-commerce) makes business mobility a reality; mobile users could access the Internet at any time, from anywhere with handheld devices or laptop. A 3G enabled smart phone enables you to access a wide range of services anywhere and anytime. For example, you can send and receive e-mail, make cinema and restaurant reservations and pay for them, check real train time, look at digital maps, download music and games, and also browse the Internet. Mobile and wireless services are ranging from mobile communication networks to wireless local area networks. The service provided by mobile communication systems has achieved huge success as mobile and wireless communication technologies are converging at fast speed. We will study mobile and wireless communication in relation to mobile phones. Hence, m-commerce is defined as electronic commerce carried out in handheld devices such as smart phone through mobile and wireless communication network.

BACKGROUND

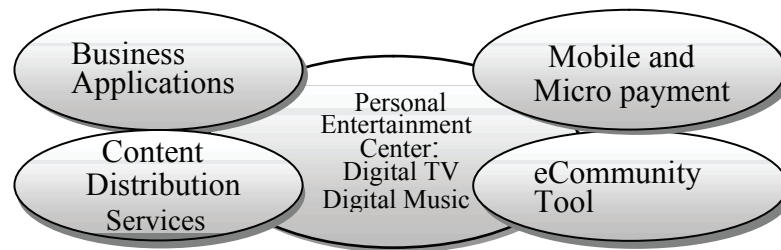
E-commerce was once characterized by e-marketplaces, online auction systems that act as the intermediary between buyers and sellers. Now it is evolving toward social network in which users take the control on the contents. Social networks such as YouTube (<http://www.youtube.com>) enable participants to share life experiences by posting video clips taken by mobile phones especially. The integration creates rich user-generated contents. At the same time, m-commerce also undergoes the evolution too. Many new business models have been established around the use of mobile devices.

Mobile devices have the characteristics of portability, low cost, more personalization, GPS (global positioning system), voice etc. The new business models include micro payment and mobile payment, content distribution services, business services, and personal multimedia entertainment center (see Figure 1). 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), and using positioning systems for intelligent distribution of personalized information by location (e.g., 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 profiles 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 (Tsalgaidou & 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 customer 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 personal entertainment center. A wide range of entertainment services are available, which consist of online game playing, ring tones download, watching football video clips, live

Figure 1. M-commerce applications



TV broadcasting, music download, and so on. Unsurprisingly, adult mobile service and mobile gambling service are among the fast growing services. Juniper Research Inc. estimates that worldwide revenue from adult mobile content will jump from US\$500 million in 2004 to \$2.5 billion in 2009 (Korzeniowski, 2005). In the market of mobile games, Juniper Research estimates that annual revenues will have passed the \$3 billion mark by the end of 2006. It also acts as a community tool to generate a lot of revenue from SMS (short message service). SMS broadcasting is an ideal communication tool in community.

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. Also it makes paperless office a reality so that off-site engineers or salesmen don't need to carry loads of paper such as delivery note to their clients. 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: wireless technologies, 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.

Economic Aspect

The delay in 3G mobile network operators (MNO) is 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 Telefónica, and the UK's Vodafone spent an estimated US\$125 billion to US\$150 billion on 3G licenses (Garber, 2002). Many of them are burdened with high debts. In Europe, 3G was slowly rolled out in 2004 and the number of users was less than 1 million after a huge price cut campaign. As a result, MNOs are reluctant to build the infrastructure of 3G (e.g., O2 in UK).

Social Aspect

With the exception of Korea and Japan, there is a lack of interest in 3G mobile phone. The Western European market has reached saturation point, where mobile possession rate is close to 100% in some countries. In addition, mobile users have "upgrade fatigue" (i.e., they are reluctant to upgrade their mobile phones). In 2002, the mobile phone business pushed very hard on picture messaging, which required new expensive handsets. The response was poor. The mobile revenue mainly comes from the voice calls and SMS messaging. Recently, Apple iPod is a big success. It transforms the music industry and shows that consumers are willing to pay for download music. In 3 GSM world Congress 2005, mobile phone operators are unveiled to team up music companies and mobile phone manufacturers to offer digital music download and play in mobile phone. MNO hopes that they can attract the customers to use their network to download music.

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