

M-COMMERCE PAYMENT SYSTEMS IN SOUTH KOREA

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ABSTRACT

With the growth of information and communication technologies, various new developments are taking place in the world. One of the major developments, which are gaining important in Korea, is mobile payment system. The objective of this paper is to discuss overall view of mobile payment systems and its impact on m-commerce in Korea. In the first part of the paper, mobile commerce in Korea is characterized. Subsequently, mobile payment mechanism is described by analyzing two major mobile operators focused on their payment service. Future research directions are given and implications of the study are discussed.

KEYWORDS

Mobile commerce, Mobile payment systems, Wireless Internet.

1. INTRODUCTION

Internet and related technologies are becoming more prominent and their usages are having wider both in developing and developed countries. With the rapid development of information technology, payment services have been one of the major applications of mobile commerce. All these happened to be backed up certain technological advantage in that country. In recently years, Korea came into the mainstream along with the mobile payment systems. Based on well-established infrastructure, the trend for utilizing mobile payment systems is noticeably increasing in Korean market.

This paper looks into the application of the mobile payment systems and driving forces for utilizing them in Korea. The remainder of this paper is organized as follows. In section 2 we discuss the literature review of mobile commerce and its payment systems. Next in section 3 we describe the general environment and the structure of mobile payment markets in Korea and perform case study. Finally, in section 4, we present the main conclusion of our research and delineate future related research.

2. OVERVIEW OF MOBILE PAYMENT SYSTEMS

Several researchers defined mobile commerce and mobile communications in various ways. Mobile commerce is defined as any transaction with a monetary value that is conducted via a mobile telecommunications network (Zheng and Chen, 2003). Mobile communications can be defined as delivery of

content, notification and reporting including transactions with mobile devices (Kumar and Zahn, 2003). As the markets are moving global with shifting working conditions from desk to the different locations mobile phones are increasingly becoming essential to both businesses and the Organizations. Unlike fixed telephones, mobile telephones can adjust to these emerging conditions of work anywhere and any time transcending the geographical boundaries. Most of these applications are promising in Europe and Asia (Dholakia and Dholakia, 2002). More particularly in East Asia, Korea has a better-established infrastructure and a stronger customer services to suit to these emerging conditions. Korea has also introduced advanced and effective technologies such as VDSL (Very High Speed DSL), IMT2000 that applies both to wired and wireless Internet. One of the most important features of mobile commerce is that it is not a single entity and its success depends upon several other related industries both software and hardware fields (Barnes, 2002; Sabat, 2002). Thus, the essence of digital economy lies in a proper cooperation, coordination for any activity to become successful. This phenomenon is widely seen in mobile industry. In these industries there is a fundamental split in business models between customers and the supporting services with underlying communications networks and the ownership of rights to offer wireless services through there devices.

The term “mobile payment” means payment methods that are based on the mobile phone (Henkel, 2001). Mobile payment is becoming a major area in mobile commerce. Many research surveys predict that worldwide mobile commerce market will reach more than \$200 billion by 2004 (Vetter and Kalakota, 1999). It means that there will be a rapid growth in the areas of mobile shopping and mobile advertising in future. There are several payment methods both existing and which are developing (Zheng and Chen, 2003). There are two methods, which are commonly used. First, the account-based system is where a customer is associated with specific number, which is provided by Internet Payment Provider (IPP), and accordingly the customer is billed based upon his balance in his card. Second, in token-based payments method a customer has to convert currency to their electronic equivalent in the form of tokens. The payment methods vary in time and space. In the following section we will discuss under Korean conditions with two major players in the market.

3. THE CASE OF SOUTH KOREA

Korea is becoming a huge market for mobile business with the success of Internet business and online transactions. With the introduction of IMT-2000 service this market is expected to increase dramatically (Park et al., 2002). E-commerce market in Korea is now shifting its customers towards mobile commerce with mobile ticketing and payments. Mobile commerce market in Korea is divided into three mobile operators: SKT, KTF and LGT which are based upon CDMA technology. The number of users as of January 2003 exceeded 35 million surpassing the fixed –line users. Because of high sophisticated infrastructure it took very short time to penetrate into the market. As of January 2003, the market shares of SKT, KTF and LGT were 53%, 32% and 15% respectively. Their respective shares of wireless Internet service were roughly the same at 51%, 35%, and 14% as shown in Table 1.

Table 1. Market share in the mobile communication market (Yoon et al., 2003)

	SKT	KTF	LGT	Total
Mobile internet subscriber	14,789,000	10,241,000	4,055,000	29,085,000
Market share of mobile carriers	50.8%	35.2%	13.9%	100%
Mobile service subscriber	17,220,000	10,333,000	4,790,000	32,343,000
Market share of mobile carriers	53.2%	31.9%	14.8%	100%

With the introduction of CDMA 2000 1x/EV-DO service, the mobile market is in a rapid phase of development. In near future it is expected to grow at an average annual rate of 18 trillion won by 2007 (Yoon et al., 2003). Wireless technologies have developed a wide range of products and services in a constant and systematic phase in Korea. So far, three kinds of services has introduced in mobile market. First, CDMA 2000-1X was introduced with QUALCOMM’s technology in October 2000 with transmission speed of 144Kbps. Second, in 2002, SKT and KTF launched EV-DO technology which can transfer data at up to 2.4Mbps which is 16 times faster than the transmission capability of CDMA 2000-1x as shown in Table 2. The new 3G services were introduced in Korea in 2003 based on W-CDMA technology known as IMT-2000, which is launched by KTF and SKT (Seo et al., 2003).

Table 2. Wireless technologies in Korea (Seo et al., 2003)

	2G		3G
Specification	IS95A/B	CDMA 2000-1x	CDMA 2000-1x EVDO
Mobile carriers	SKT, KTF, LGT	SKT, KTF, LGT	SKT, KTF
Coverage	National wide	National wide	Metropolitan, Provincial cities
Service starting date	Oct 1999	Oct 2000	May 2002
Switching method	Circuit switching	Packet switching	Packet switching
Maximum speed	14.4 ~ 64Kbps	144Kbps	2.4 Mbps
Killer services	SMS, Download, Browsing	Image VM-based services	MMS VOD

There are various mobile content services such as short messaging services, downloading, video streaming, multiplayer games, and mobile payment, which provide support for transaction processing in Korea. Regarding mobile payment, SKT offers a variety of service applications such as purchasing, transport services, auctions, and shopping, whereas KTF introduce mobile payment system with brand name "K-MERCE". As mobile payment services become mature market, the role of two major players, SK and KTF, capturing 86% of the market share also becomes very important as well. Korea's mobile commerce can be understood with analyzing both SKT and KTF as mobile operators at a given point of time. SKT's history dates back to 1984 when it started with Korea Mobile Telecommunications Service Co., a government run agency that was acquired by SK Group, which is a major shareholder of the company. SKT has introduced variety of new services that includes mobile media, wired and wireless integrated multi-internet service, financial network with a cellular handset, global roaming service, and network service. In November 2002, SKT commercially launched a full-featured mobile payment system called "MONETA" which is a mobile terminal enabled e-wallet relying on IrDA communication by Points of Sale+ SIM card +PKE+AAA Server (Kim, 2002; Chung, 2003). This gave a boost to the mobile commerce business in general, which then introduced all types of mobile commerce transactions such as catalog sopping, Internet banking, online gaming over cellular pones, PDA's, and other mobile instruments. MONETA further helps the customer in making calls, payments for public transport, and membership services (Kim et al., 2003). Figure 1 illustrates the structure of MONETA service. As of December 2003; 800,000 of SKT subscribers availed MONETA services and they are expected to increase this service to all of SK subscribers by 2004 to take advantage of the existing 50% market share of SKT (Kim et al., 2003). This will certainly spread widely across all sections even to common people of this time.

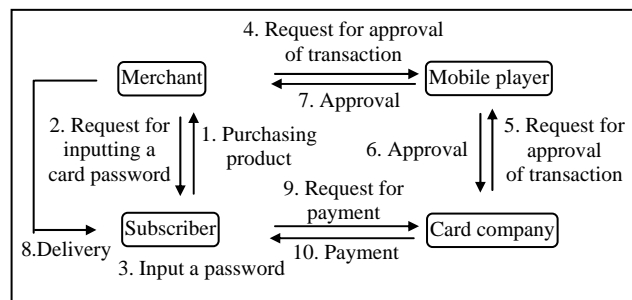


Figure 1. MONETA service (Kim et al., 2003)

KTF, the second largest service operator in Korea, was established in May 2001, which later merged with Hansol PCS Corp. KTF introduced its mobile payment system K-MERCE in June 2002 and later upgraded it to new K-MERCE phones on IrFM communications in December 2003. K-MERCE is providing various wireless solutions for personal finance, shopping and payments all on one cellular phone. K-MERCE services are divided in to three categories such as finance which provides services like banking and payments, sopping which allows purchasing, reservations and tickets purchasing, and payments that provides services to pay on/off line with a mobile phone using methods such as electronic wallet and phone. MONETA and K-MERCE have widely accepted as a common payment media with the recent strategic alliance between mobile operators and bank companies.

4. CONCLUSION

From the review of literature and case study, we learn that there is much chance for m-payment system to happen in Korea. Through a discussion we came across the following findings. First, the results from case study clearly reveal that mobile payment systems have widely accepted in Korea. Our results show that the rapid spread of mobile payment systems is strongly related to the initiatives such as sensitive in adopting new technology, continuous providing of new contents related to the mobile payments services, and well established infrastructure. Korea has utilized successfully this situation very well. It also utilized its widespread and advance infrastructure up to its requirements. This was well taken by its population who are receptive in adopting new technologies, which are advanced by respective companies. Second, even though higher levels of support are noted in mobile payment service area, Korea has problems still hang in around such as lack of core technologies, financial problems in the economy and some emerging privacy problems. This result lead us to the conclusion that with a proper approach to these problems both at policy level and at implication level may successfully give the world a concrete and standard mobile payment system.

The findings of this paper provide several contributions to theory and practice. The main business benefits of this study can be summarized as followings. First, with the rapid growth of m-commerce, mobile payment systems play an important role as a tool for providing transaction efficiency. Second, we give some implications both on the development of those technologies itself and at the same time its implications on the wider spread of those technologies. This study has the following limitations that needed to be overcome in the future research. First, some other academic references related to mobile payment systems should be reviewed thoroughly. Second, Our works focus on overall view of Korean mobile payment systems due to characteristics of Korea's informatization status. Therefore, more detailed case studies focused on transaction process of mobile payment systems in Korea should be conducted.

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