

Mobile Payment and the Charging of Mobile Services

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INTRODUCTION

According to the sweeping enthusiasm that characterized much of the news reporting in the years 1999 and 2000, mobile phones should by now have been firmly established as payment terminals in the most diverse fields. However, reality today is a different matter. Mobile payment as an established payment system seems to be a distant prospect in the case of most countries.

Since the mid-1990s there have been serious efforts to use mobile phones for payment processes. The starting point for these considerations was the fact that mobile phones are particularly suitable for conducting payment processes due to their specific characteristics, high diffusion in population, and users' positive attitude towards them (e.g., Henkel, 2002). In recent years several studies showed that customers in principle take an interest in mobile payment (e.g., Khodawandi, Pousttchi, & Wiedemann, 2003; Eisenmann, Linck, & Pousttchi, 2004). A further study bridged the gap of these and other studies' explanatory power, and confirmed a high interest also in the total population. During a representative study in September 2004, 49.6% of the German participants indicated that they are interested in and willing to use mobile payment (MobilMedia, 2004).

The commercial history of mobile payment procedures is short, but simultaneously characterized by rapid development. One of the first commercial mobile payment procedures was launched by the Finnish *mobile network operator* (MNO) Sonera in 1997. Customers were able to pay for goods at vending machines (Dahlberg, Mallat, & Öörni, 2003). New technological innovations used in mobile payment procedures and new use case scenarios for mobile payment have been developed at an increasingly fast pace ever since. Among the leading countries in mobile payment are Austria, South Korea, Singapore, Norway, Spain, Japan, Finland, and Italy, in which end-to-end solutions and clear business models have proved to be sustainable after four to five years of field trials and pilot projects (Taga & Karlsson, 2004).

However, in other countries the situation is disillusioning. For instance on the German market (which is not only the most important European market, but also a good sample for developments in many western markets), banks (e.g.,

Payitmobile), MNOs (e.g., Genion M-Payment), as well as quite a number of specialized intermediaries (e.g., Paybox, Geldhandy, or Street Cash) tried one's luck in recent years. Also the vertical alliance of the four large-scale and internationally active MNOs—Orange, Telefonica Moviles, T-Mobile, and Vodafone—was not able to start its integrated mobile payment system Simpay. When it was initiated in 2002, the primary objective was to introduce a pan-European mobile payment system for all payment scenarios. However, after six months a smaller compromise was made: providing a solution for their most urgent problem, charging mobile services, and additionally enabling payments for digital goods on the Internet. Also this did not come off. After numerous delays and intestine strife between the founders, Simpay finally stopped its activities in the middle of 2005 (Pousttchi & Wiedemann, 2006).

Thus, it can be concluded for the majority of countries that most mobile payment procedures were quit after the test stage, and procedures that came into the market had some diffusion, but outside of Asia, not many of these can be categorized as economically successful, although the preconditions for acceptance of mobile payment by customers are very good.

BACKGROUND

The diffusion of mobile phones during the nineties and the success of mobile services such as ring tones and logos have raised high expectations toward mobile commerce. We define *mobile commerce* as any kind of business transaction, on the condition that at least one side uses mobile communication techniques (Turowski & Pousttchi, 2004).

Mobile payments are expected to become one of the most important applications in mobile commerce (Varshney & Vetter, 2002). On closer examination of mobile payment, we have to differentiate two basic functions: payments inside and outside mobile commerce. Inside mobile commerce mobile payment is used for payments of mobile offers and is ideally system inherent. In the area of charging mobile services, we distinguish two basic terms: mobile billing and mobile payment. We refer to *mobile billing* as billing of

telecommunication services by an MNO within an existing billing relationship (Turowski & Pousttchi, 2004). The MNO could also be a mobile virtual network operator (MVNO) to which our following models and concepts would apply analogously. We define *mobile payment* as that type of payment transaction processing in the course of which—within an electronic procedure—at least the payer employs mobile communication techniques in conjunction with mobile devices for initiation, authorization, or realization of payment (Pousttchi, 2003). If a mobile payment procedure is provided by an MNO, we will have the intersection of mobile billing and mobile payment.

Analyzing different mobile payment procedures on joint characteristics, Kreyer, Pousttchi, and Turowski (2002) derive five standard types. The standard type with the most practical relevance today is the standard type phone bill, which is characterized by an MNO as the mobile payment service provider and the mobile phone bill as the settlement method. These procedures are normally either limited to the mobile commerce scenario or especially developed for this scenario. An example for the first case is the system inherent payment procedure of i-mode; examples for the second case are the different applications of premium rate SMS and the procedure m-pay of Vodafone.

As later discussed, mobile payment is crucial for mobile commerce, but not limited to this scenario. Outside mobile commerce, a mobile payment procedure can be understood as a mobile commerce application to complete payments in different situations. For this purpose four general settings, defined as payment scenarios, are to be considered (Kreyer et al., 2002; Khodawandi et al., 2003): transaction on the stationary Internet (electronic commerce scenario), at any kind of vending machine (stationary merchant automat scenario), in traditional retail (stationary merchant person scenario), and between end-customers (customer-to-customer scenario). The emphasis of this article is on mobile payment inside mobile commerce (mobile commerce scenario).

Analyzing the business model of a mobile service, we can distinguish—similar to electronic commerce—between direct and indirect revenue sources and transaction-dependent and transaction-independent revenue types (Turowski & Pousttchi, 2004, according to Wirtz, 2001). Concepts based exclusively on indirect revenues, for example, financed by advertisement, already failed on the stationary Internet, except for very few exceptions. The realization of transaction-independent revenues in mobile commerce (e.g., by sale of a subscription) is appropriate for certain kinds of services. However, subscription will have a rather inhibiting effect on the diffusion of many typical mobile services, in particular if customers want to use the service spontaneously or only occasionally. If direct transaction-dependent revenues are to be realized, then an adequate charging form between providers and customers will be necessary. Whereas in electronic commerce we still see an important

role of traditional payment systems (e.g., Krueger, Leibold, & Smasal, 2006), a payment system for mobile commerce will typically not be adequate until it shares fundamental characteristics of the mobile offer it is to bill for, in particular its ubiquity (Pousttchi, Selk, & Turowski, 2002). This is in line with Coursaris and Hassanein (2002) and Mallat (2004). Their arguments are based on the fact that mobile commerce provides an opportunity for customers to reach services anytime and anywhere, and this implicates that also the payment procedure needs to follow these properties. Likewise, already Kieser (2001) Zobel (2001) derived the necessity of available mobile payment procedures from the necessity of charging of goods and services in the mobile commerce scenario, and additionally from the fact that traditional payment procedures are inapplicable in mobile commerce. Since companies are not going to invest in the development of innovative mobile applications or services unless they can be charged for appropriately, the existence of adequate possibilities for charging of the goods and services is crucial (Pousttchi et al., 2002). This is in line with Dahlberg et al. (2003) who stated that problems with payments profoundly hinder the development of mobile commerce.

As a result mobile payment is crucial for, but not limited to the mobile scenario. On the contrary, the universal applicableness of a mobile procedure in scenarios outside mobile commerce is relevant for its acceptance (Kreyer et al., 2002).

MOBILE PAYMENT INSIDE MOBILE COMMERCE

Offer Models

The most important subset of mobile commerce is the area of mobile value-added services. Due to the fact that the transmission of data is a substantial component, it is classified as a telecommunication service in the broader sense. Hence, the charging by the MNO is legally allowed in most countries, whereas payment outside of mobile commerce often requires a banking license. Typical examples for mobile added-value services are news, financial information services, or entertainment services. In principle, we distinguish two offer models: the offer by the MNO and the direct offer by a mobile content provider (Turowski & Pousttchi, 2004). The offer by the MNO is an MNO-centered solution. The MNO produces mobile services or buys them from a mobile content provider (just as he or she buys into network infrastructure or mobile devices) and thus offers a single face to the customer for network and services. An explicit payment process is not necessary, because typically only transmission is charged and consequently, mobile billing is applied similar to mobile voice services. This model was (and still is) usual on many markets and documents the market power of the

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