Chapter XI

SeMoPS: A Global Secure Mobile Payment Service

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Abstract

Many experts consider that efficient and effective mobile payment solutions will empower existing e- and m-commerce efforts and unleash the true potential of mobile business. Recently, different mobile payment approaches appear to the market addressing particular needs, but up to now no global mobile payment solution exists. SEMOPS is a secure mobile payment service with an innovative technology and business concept that aims to fully address the challenges the mobile payment domain poses and become a global mobile payment service. We present here a detailed description of the approach, its implementation, and features that diversify it from other systems. We discuss on its business model and try to predict its future impact. The aim is to provide an insight of a new mobile payment service and discuss implementation decisions and scenarios.

Introduction

The increasingly popular ownership of mobile personal, programmable communication devices worldwide promises an extended use of them in the purchase of goods and services in the years to come (Mobey Forum, 2003). Security in payment transactions and user convenience are the two main motivations for using mobile devices for payments. Authorisation in existing electronic payment systems, including ATM and credit/debit card transactions as well as online payments through a PC, is based on account-holder authentication. Account-holder authentication, however, can fail in multiple ways, of which the most usual is the case of the compromise of the user’s computer, which is, typically, protected with minimal security mechanisms and processes. Moreover, existing payment networks do not always distinguish among user fraud, compromise of the user’s computer, or compromise of the bank’s computer. For example, in most countries, if the user claims not to have authorised a credit card transaction, the transaction has to be cancelled and the bank cannot prove that the user is not cheating. In such cases, responsibility is not necessarily allocated fairly, and non-corrupted, innocent parties may find themselves responsible for somebody else’s fraudulent activity or security breach. The lack of a technical solution for preventing and resolving fraud creates substantial risk and expense for users, merchants and banks alike.

It is now well understood that a secure electronic payment transaction can only be ensured through a device that offers its own I/O interface to the user, so that the initiator of the payment transaction is clearly identifiable (Pfitzmann, Pfitzmann, Schunter & Waidner, 1999). Mobile personal devices provide a technical solution for personalised I/O interface to payment transactions since it can be safely assumed that the transaction initiator is in the majority of the cases also the owner of the mobile device. Security in payment transactions through a mobile device, therefore, is ensured by the authentication mechanisms of existing mobile devices, as a way to prevent call theft. Moreover, additional built-in mechanisms to ensure secure transaction authorisation and execution are relatively easy and inexpensive to be incorporated by device manufacturers. Therefore, payment through mobile devices benefits merchants and banks by supporting transactions where most fraud is prevented and responsibility for the remaining fraud is fairly allocated. As far as the end customer is concerned, the value of secure transactions far outweighs their possible cost.

Convenience is the other reason why people are expected to use mobile personal devices for payments. Convenience can result from people using their mobile personal device when paying for goods and services, while on foot, in cars, planes, or trains, and when authorising payment transactions at remote servers of banks, brokerages, and merchants. Payments through mobile devices will enable validation of the customer’s consent to the transaction during online, by telephone or by post purchases, since the merchant and the customer are at separate locations and the merchant cannot get the customer to sign in order to authorise the payment. In addition, payment through mobile devices will enable the secured purchase of content and services delivered via the network, as well as person-to-person payments and money transfer.

SEMOPS is a secure mobile payment service with an innovative technology and business concept (Karnouskos, Vilmos, Hoepner, Ramfos & Venetakis, 2003) that aims to fully