Chapter 11
Overview of Mobile Payment: Technologies and Security

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ABSTRACT

According to the Mobile Payment Forum, mobile payments are the transactions with a monetary value that is conducted through a mobile telecommunications network through diverse mobile users devices, such as cellular telephones, smart phones or PDAs, and mobile terminals. Mobile payment is a transfer of funds in return for goods or services in which a mobile device is functionally involved in executing and confirming payment. The payer can be standing at a POS or be interacting with a merchant located somewhere else. Mobile payment systems enable customers to purchase and pay for goods or services via mobile phones. Here, each mobile phone is used as the personal payment tool in connection with the remote sales. Payments can take place far away from both the recipient and the bank. This chapter gives an overview of mobile payments.

INTRODUCTION

The growth in wireless technology increases the number of mobile device users and gives pace to the rapid development of e-commerce conducted with these devices. The new type of e-commerce transactions, conducted through mobile devices using wireless telecommunications network and other wired e-commerce technologies, is called mobile commerce, increasingly known as mobile e-commerce or m-commerce. Mobile commerce enables a new mode of information exchange and purchases, and it presents an unexplored domain. To customers, it represents convenience; merchants associate it with a huge earning potential; service providers view it as a large unexplored market; governments look it as a viable and highly productive connection with their constituents. In short, mobile commerce promises many more alluring market opportunities than traditional e-commerce. M-Commerce is an area arising from the combination of electronic commerce with emerging mobile and pervasive computing technology.

The most important application of mobile Commerce is Mobile payments. These services makes a mobile device to act as a business tool replacing bank, ATM, and credit cards by letting a user conduct financial transactions with mobile money. A mobile user attempts to purchase goods
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or services from a business or service provider, which then contacts a trusted third party, the wireless service provider, or a financial institution to authenticate the user and amount of purchase. Once approved, a mobile payment can be made and the purchase is completed. The corresponding funds can then be withdrawn from user’s m-wallet, charged to user’s phone bill, or subtracted from user’s bank account. Alternatively, the user could pay using mobile money provided to him by another user or a third party mobile money provider. Mobile money can be moved freely among users either by using a local area wireless network or by using the wireless service provider’s network. Several groups are working on mobile payments, including PayCircle that is established by HP, Lucent, Oracle, Sun, and Siemens. Mobile financial transactions require a strong level of security support. Although, security features have been added in mobile middleware such as WAP for financial applications, wireless PKI (Public Key Infrastructure), a system to manage keys and certificates, is used to authenticate and obtain digital signatures from mobile users. The payment system is an application responsible for increase in competitive advantage in organizations. Researchers are interestingly working in the area of mobile payments as it is multidisciplinary in nature and works in collaboration with different areas like telecommunications, wireless networking, mobile computing and security.

1. BACKGROUND

Chen et al. (2010) described a mobile payment system for merchant micropayments that can be built on existing GSM and NFC architecture components. The author’s proposal leverages the SIM’s authentication and identification capabilities and used cryptographic primitives, which simplifies integration into the current mobile infrastructure. The use of NFC for short range communication allows for possible integration with existing Point-Of-Sale (POS) equipment and the payment process from the customer and merchant’s perspective remains unchanged. Liu et al. (2010) proposed a trust model to protect the user’s security. The billing or trust operator works as an agent to provide a trust authentication for all the service providers. The services are classified by sensitive calculations. With this value, the user’s trustiness for corresponding service can be obtained. For, decision, three ranks: high, medium and low. The trust region tells the customer with his calculated trust value, which rank he has got and which authentication methods should be used for access. Authentication history and penalty are also involved with reasons. Yang et al. (2010) gives a general framework of online mobile payment and presents a new mobile payment pattern which advocates stratified extension and cascading agent based on stable and credible platform group. It also proposes a cross-bank unified payment platform to solve the difficulties of connection to banks. As a result, the authors got the regular effective and monitoring payment process which is of great manoeuvrability. The mobile payment process will be more reasonable and the transaction will be more secure. This framework was given to solve the problem of mobile applications that are difficult to be connected with the banks. Asghar et al. (2010) have surveyed five different models in the field of mobile payment in their research; then they were compared with MCDM evaluation methods applications. To implement a mobile payment service, there are many actors involved such as bank, operator and service provider. As an effective interaction role and in order to optimize efficient parameters for implementing a mobile payment solution a suitable business model is necessary. Since one of the most effective parameter to select an appropriate business model is the banks/operators structure of every country, the proposed business model is localized based on the Iranian banks/operators’ framework. The results of MCDM method indicate that the collaboration model is the most suitable mobile payment busi-