Chapter IX
M-Payment Solutions and M-Commerce Fraud Management

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ABSTRACT
Mobile security and payment are central to m-commerce. The shift from physical to virtual payments has brought enormous benefits to consumers and merchants. For consumers it means ease of use. For mobile operators, mobile payment presents a unique opportunity to consolidate their central role in the m-commerce value chain. Financial organizations view mobile payment and mobile banking as a way of providing added convenience to their customers along with an opportunity to reduce their operating costs. The chapter starts by giving a general introduction to m-payment by providing an overview of the m-payment value chain, lifecycle and characteristics. In the second section, we will review competing mobile payment solutions that are found in the market-place. The third section will review different types of mobile frauds in the m-commerce environment and solutions to prevent such frauds.

INTRODUCTION
Mobile commerce (m-commerce) grows dramatically. The global m-commerce market is expected to be worth a staggering US$200 billion by 2004 (Durlacher Research, n.d.; More Magic Software, 2000). M-commerce can be defined as any electronic transaction or information interaction conducted using a mobile device and mobile networks, for example, wireless or switched...
public network, which leads to transfer of real or perceived value in exchange for information, services or goods (MobileInfo.com). M-commerce involves m-payment, which is defined as the process of two parties exchanging financial value using a mobile device in return for goods or services. A mobile device is a wireless communication tool, including mobile phones, PDAs, wireless tablets, and mobile computers (Mobile Payment Forum, 2002).

Due to the widespread use of mobile phones today, a number of payment schemes have emerged which allow the payment of services/goods from these mobile devices. In the following sections an overall view of the m-payment value chain, the m-payment life cycle and the m-payment characteristics is given. Also the operational issues are analyzed, which are critical to the adoption level of a payment system. The operational issues or characteristics will help in the unambiguous identification of the payment solutions.

**M-PAYMENT VALUE CHAIN**

Many different actors can be involved in mobile payment process (McKitterick & Dowling, n.d.; Mobile Payment Forum, 2002). For example, there is a consumer who owns the mobile device and is willing to pay for a service or product. The consumer initializes the mobile purchase, registers with the payment provider and authorizes the payment. A content provider or merchant sells product to the customer. In the mobile payment context, content can range from news to directory services, shopping and ticketing services, entertainment services, and financial services. The provider or merchant forwards the purchase requests to a payment service provider, relays authorization requests back to the customer and is responsible for the delivery of the content. Another actor in the payment procedure is the payment service provider, who is responsible for controlling the flow of transaction between mobile consumers, content providers and trusted third party (TTP) as well as for enabling and routing the payment message initiated from the mobile device to be cleared by the TTP. Payment service provider could be a mobile operator, a bank, a credit card company or an independent payment vendor. Another group of stakeholders is the trusted third party, which might involve network operators, banks and credit card companies. The main role of the TTP is to perform the authentication and the authorization of transaction parties and the payment settlement.

Finally there are mobile operators who are more concerned with the standardization and interoperability issues. They may also operate mobile payment procedure themselves and provide payment services for customers and merchants. One thing that needs to be considered is who receives the customer data. Customers rarely wish to divulge any information, whereas the same customer information might be important for merchants or content providers for their business. Payment procedures need to ensure that none of the players receive the data, for example, when customers use a prepaid payment solution to buy goods but also need to require divulging customer information to any of the players considered.

**M-PAYMENT LIFECYCLE**

Payment transaction process in a mobile environment is very similar to typical payment card transaction. The only difference is that the transport of payment detail involves wireless service provider. WAP/HTML based browser protocol might be used or payment details might be transported using technologies such as blue tooth and infrared (Mobile Payment Forum, 2002).

Mobile payment lifecycle shown in Figure 1 includes several main steps (Telecom Media Networks, 2002):