Chapter XIII
Framework for Mobile Payment Systems in India

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ABSTRACT
This chapter introduces concepts, frameworks and possible models for introducing mobile payments in India. The introductory section defines mobile payments, outlines its characteristics and identifies the stakeholders. Ideally, mobile payments have to be simple and usable, universal, interoperable, secure, private, affordable and be available within the country wide as well as globally. There are various stakeholders in this context: the customer, the merchant, banks, mobile network operators, software and technology service providers, mobile device manufacturers and the government. The technology considerations are addressed in a technological landscape with a wide variety of possibilities for implementing mobile payments. Implementations can be based on different access channels to the mobile device such as SMS, USSD or WAP/GPRS. The relative advantages and disadvantages each of these channels for mobile payments are discussed. Generic architectures that employ these technologies are modeled. The mobile phone carrying debit or card information (Track 2) within the device can act as a payment instrument. It can be used to extend the present day card based payment systems. This requires an independent entity called as a Trusted Service Manager (TSM) who provides the necessary hardware and software for handling transactions. The TSM is an intermediary between the financial institutions (banks) and the mobile network operators (telecommunications industry). Essentially the TSM accepts the information from the customer owning a mobile and it routes the financial transaction to the bank or an inter-bank clearing and settlement system (using an electronic interface—a financial switch) or to a payment systems operator (in the case that the customer is using a credit card). Possible models for one TSM in the country or having several independent TSMs are outlined. The TSMs may commu-
INTRODUCTION

Definition and Scope of Mobile Payments

Mobile commerce is a natural successor to electronic commerce. The capability to pay electronically coupled with a website is the engine behind electronic commerce. Electronic commerce has been facilitated by automatic teller machines (ATMs) and shared banking networks, debit and credit card systems, electronic money and stored value applications, and electronic bill presentment and payment systems. Mobile payments are a natural evolution of e-payment schemes that will facilitate mobile commerce. A mobile payment or m-payment may be defined, for our purposes, as any payment where a mobile device is used to initiate, authorize and confirm an exchange of financial value in return for goods and services (Au and Kauffman, 2008). Mobile devices may include mobile phones, PDAs, wireless tablets and any other device that connect to mobile telecommunication network and make it possible for payments to be made (Karnouskos and Fokus, 2004). The realization of mobile payments will make possible new and unforeseen ways of convenience and commerce. Unsuspected technological innovations are possible. Music, video on demand, location based services identifiable through mobile handheld devices—procurement of travel, hospitality, entertainment and other uses are possible when mobile payments become feasible and ubiquitous. Mobile payments can become a complement to cash, cheques, credit cards and debit cards. It can also be used for payment of bills (especially utilities and insurance premiums) with access to account-based payment instruments such as electronic funds transfer, Internet banking payments, direct debit and electronic bill presentment.

Several mobile payment companies and initiatives in EU have failed and many have been discontinued (Dahlberg et al., 2008). In Europe and North America with few exceptions such as Austria, Spain and Scandinavian countries the development of mobile payments have not been successful. However, mobile payment services in Asia have been fairly successful especially in South Korea, Japan and other Asian countries (e.g., Mobile Suica, Edy, Moneta, Octopus, GCash). NTT DoCoMo has 20 million subscribers and 1.5 million of them have activated credit card functionality in Japan. There are 100,000 readers installed in Japan (Ondrus and Pigneur, 2007). The main difference between successful implementations of mobile payment services in the Asia Pacific region and failure in Europe and North America is primarily attributed to the ‘payment culture’ of the consumers that are country-specific.

This chapter discusses a generic technical architecture for mobile payments. First a literature review framework outlines the broad context in which mobile payments operate. Following this we outline the general characteristics of mobile payments. The technology considerations of mobile payment solutions bring out the differing