Preface

We wrote this book for people who wanted an in depth look at how new emerging area of mobile technology has changed the relationship of business organizations and consumers. Mobile technology is one of the major tools available to everyone for achieving operational excellence, smart way of buying products and services, achieving competitive success and improving decision of making payment using mobile.

While talking about mobile technology everyone often looks for different mobile devices and its services. Mobile commerce is also the service of mobile technology. The security is the major concern with mobile commerce while making any transaction. Regardless of whether you are in telecommunication, management, internet service provider, mobile device developer, software development, hacking and in security development technology you will find this book will be valuable throughout your career development.

We have made every effort to ensure the authenticity and authority of different cases and data used through this text. You will find in this book that issues related to security and risk with mobile transaction are latest and have 2015 sources. The research literature as well as professional detail and publication form an important foundation of our work.

WHAT IS NEW IN MOBILE COMMERCE?

A lot. In fact there is whole world doing business using mobile technologies for managing and organizing business operations which makes the mobile commerce as the most exciting area of study in schools, colleges and in professional bodies. A continuous stream of mobile commerce innovations is transforming the trend of traditional business world. Examples includes the emergence of mobile technology in business what we say is mobile commerce, the growth of different payment mode to make transaction with mobile devices, and not least the use of mobile commerce in satisfying our daily need of services and products. Most of these changes have occurred in last few years. These innovations enabled the business entrepreneurs and organizations to develop new and secure mobile commerce business model and transform the day to day conduct of business. In this process some old business practices are being destroyed and new businesses are springing up.

For instance, the online ticket booking for PVR, railway or airlines has changed the older business model of getting ticket booked by the agent or by standing in queue. Similarly online money transaction to different bank accounts, making a payment to any showroom or buying any product like grocery, personal or home décor and making the payment online without going to the physical stores has given a new definition to mobile commerce.
Mobile commerce is expected to account for 2.5 times as much revenue as the rest of the app economy put together in 2015. Mobile commerce is new version of e-commerce. While this iconic version of e-commerce i.e m-commerce is very powerful and fastest growing form of retail in many countries including developing countries also, growing up alongside is whole new value stream based on selling services and goods. It’s a service model of e-commerce

App developers prioritizing the Mobile Browser (16%) have significantly higher adoption of e-commerce than iOS (11%) and Android (11%). This is explained by the ease of porting an existing web e-commerce app to mobile and leveraging the popularity of existing e-commerce apps.

While commerce may be the future of mobile, generally, it’s increasingly the present for India and other developing economies. Voskoglou (2015) said that, in India mobile commerce skyrocketed from 10% to 50% of online transactions during the last 12 months and should top 70% in 2015. That’s blisteringly fast growth. But it’s also par for the mobile course in India, which has seen companies like retailer Flipkart—India’s Amazon.com—and Myntra (now owned by Flipkart) dump the Web entirely for mobile apps. The reason for this torrid mobile commerce growth in India and throughout emerging economies everywhere is necessity. Most of the world can’t afford a laptop. Even if they can, their countries often lack the communications infrastructure to reliably access the Internet with it. It can be seen in detail in chapter consumer perception to mobile commerce in this book. Ericsson estimated that 90% of the world’s population over the age of 6 will own a phone by 2020. It therefore makes sense to construct commerce around mobile devices.

**THE CHALLENGES**

M-Commerce is convergence of mobile telecom (including network and receiving devices), computing power, internet technologies & applications and content provision (Lehner & Watson, 2001; Mylonopoulos & Doukidis, 2003) and refers to, “any transaction with monetary value that is conducted via a mobile network” (Clarke, 2001). The transaction using mobile device includes internet service provider, customer, merchant and banks that are part of this transaction holding their bank accounts. So is the risk involved at different steps to make a secure transaction with mobile devices. Security in the case of mobile commerce has more significant importance than a traditional e-commerce as it is ease to eavesdrop into other’s message with minimum difficulty in mobile environment (Gururajan, 2006). The security risk is categorized into direct and indirect risks. The indirect risk or non technical risk involves trust, confidentiality, regulatory, personal information and government concern. The regulatory and government concern can be seen in detail in the chapter regulatory framework in this book. It talks about the different regulation and government protocols imposed on nation while making mobile transaction. Memory protection is very important as most of PDA devices do not provide memory protection to mobile applications (Ghosh, 2002). Making secure transaction in mobile commerce is the biggest challenge so the study revolves around the two phases; the first phase is to identify various security risks involved in mobile transaction. It also includes the fraudulent activities occurred in mobile commerce, technical and non technical risks, theft or loss of mobile phone and limitation at the end of government, geographical factor etc. The second phase includes the solution of various security risk and developing the model and protocol to make secure transaction in mobile commerce.
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The main challenge in making secure transaction in mobile commerce includes data and information security. Software flaws like logic of program and its implementation and usage of low level language for development of application for mobile device is the one of biggest challenge in making security in mobile commerce Stuart and Bawany (2001) has described a few of such software flaws.

Mobile devices especially mobile phones are smaller in size which raises the challenges in security like limited power bandwidth and processing cycles may impose security and performance trade off. Many advanced language like Java is not a first choice of vendor for mobile programming because of time and cost constraint which becomes a challenge in software security in mobile commerce.

It’s not only hardware and security risk as the challenge in making secure transaction in mobile commerce but some-times country National IT infrastructure, Education and Awareness of citizen has important role to play as the challenge in breaking the security of mobile commerce. The major issues related to use of infrastructure are skills availability of radio frequency, technology and service cost. A minimum standard availability can hinder development (Ross, 2000).

In conclusion four main groups can be established which causes the challenges in making secure transaction in mobile commerce: first group includes technical security risk which is comprises of data and information security, platform security and software security. The second group is physical components of mobile devices which supports various workflow requirements. The third group includes non technical or indirect security risk which can be privacy, integrity, regulatory, access to infrastructure and government regulations. The fourth group makes the challenge in real time measurement and control of security and service levels in real time. The first three group provide essential components of application architecture whereas fourth group provides the control and maintenance components of application architecture. This real time control is essential because of the difficulty in describing complete security architecture is ensure security of transactions.

THE SOLUTION

M-Commerce has many advantages associated with it such as reduced transaction costs, wider access on both supply and demand side, improved quality of life through increased security and autonomy, wider choices of entertainment, communication, shopping while on move, location based services, ease and convenience of use and so on. M-Commerce is expected to play an important role in economic and social development of a country (Krishnamurthy, 2001). Growth in M-Commerce brings down transaction costs besides increasing the reach and scope of business. This leads to enhanced productivity of related industry verticals and in turn Gross Domestic Product (GDP) of a nation. Using global telecommunications panel data from 56 countries, a dynamic demand model was estimated for mobile telephony (Madden et al.2004).

Solution to these challenges for securing transaction in this mobile era is a complex task. The solution to data and information is obtained by developing new techniques for WAP, J2ME and USSD. Lei et al. (2004) poised WAP gateway acts as an interpreter between the mobile device and a web server to decode and encode the information, so that the server and the mobile device can communicate with each other. J2ME has built in consistency across products in terms of running anywhere, anytime and over any device.
Baldi and Thaung’s (2002) described i-mode and its impact as security measure in M-Commerce and also explained its adoption process from cultural prospective. Okazaki (2004) conducted an empirical study of pull-type advertising platform on i-mode which was based on users and gratifications theory of Dacoffe’s (1996). Different security models are required to control the challenges raised by software and platform security risks. Mourad et al. (2006) described J2MECLDC security model which is designed the set of attack scenario and execute them.

The solution for software flaw can be made by using algorithms. The algorithm is required to be based on table lookup, and implements white box cryptography which would be more straightforward than with block cipher, such as DES or AES. Hue Ye (2010) proposed safe and effective architecture of M-Commerce by using J2EE technology on the server side with J2ME technology on the mobile client based on three tiers. This study involves asymmetric cryptography to send the messages.

If there is any security issues that disturb the M-Commerce will actually affect the customer and organization. Therefore the solution to non-technical security risk is also an important requirement to secure transaction in mobile commerce. The solution to adopt mobile commerce and enhances the emergence of mobile commerce is very much required in growth and implementation of this technology in our daily life.

M-Commerce growth is educating subscribers on the added value in consuming M-Commerce services which in turn will lead to mass mobile adoptions (Wong & Hiew, 2005). Another important facilitator for mobile commerce is the presence of properly functioning payment systems that reduce transaction costs in the economy and promote the efficient use of financial resources (Bank for International Settlement, 2003). Various models for payments in M-domain are available (Salvi & Sahai, 2002; Krueger, 2001) but the appropriate payment mechanisms would be influenced by customer and merchant acceptance (Heijden, 2002).

A solution to loss and theft of mobile device is very much necessary as this small device contains a lot of personal information. A theft device can be cloned and help to retrieve information. A detail solution is provide by Gor (2013) describing about mobile phone cloning and preventive methods to make the mobile phone secure so that if it is lost there would no misuse of data stored on it.

Trust and confidentiality of customer plays an important role to make a success of mobile commerce. Trust of customer and their perception for purchasing and making payment through mobile device has been well documented (Refer to study conducted by Lin et al., 2010, Monno & Xiao, 2014). The major catch in mobile commerce research is the unknown of the future mobile behavior of consumer. The consumer will drive everything that happens at any kind of mass scale in mobile commerce.

Besides focusing on technical and non technical issue related to security risk and establishing new security solution by the use of programming language or algorithm, it is also important to develop and implement the new policies and regulations to enhance the awareness of people. Appropriate policy frameworks and regulatory mechanisms are necessary for development and emergence of m-commerce.

Policies related to an industry are framed by the government to steer the industry growth in desired direction with an aim to benefit the state and its citizens. Regulation is a way to modify behavior of individuals, organizations and businesses to work in a desired way, which is in the interest of society. The technologies will continue to come and go and it’s the user that will decide when and where each one hits mass scale.

A few solutions to mobile banking and mobile payment in different area are implemented in different nations. MONETA service in Korea allows consumers to make mobile payments by inserting their MONETA chip into their mobile phones. It serves as a credit card, a membership card, a ticket and a
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discount coupon. In Japan, with cooperation from JCB, a credit card company, Au by KDDI, a mobile carrier, is going to pre-install software in the IC chips in most of their mobile devices so that they can be used as a credit card. NTT DoCoMo started a new service, called i-mode Felica, in July 2004. In Finland, mobile based banking services have been available since 1996. In Belgium, Banksys, a credit card company, in conjunction with three major mobile carriers, started its mobile banking service through SIM cards in 2006. Mobister, the second largest mobile carrier in Belgium, has already put the application software on all of its new SIM cards (Banksys, 2005, p. 18). In the United States, a virtual payment solution company, Vesta, has started a SIM-based mobile payment scheme for prepaid mobile phones subscribers with Axalto, a smartcard company. In Finland, consumers can buy products from 800 vending machines by calling a premium rate number. In an international context, Jorudan, a Japanese mobile service provider, launched in December 2003 services to provide Japanese tourists abroad with transport maps, metro transfer information, and information on tourist sites in New York, Paris and London (press releases of 14 November 2003 and 7 February 2005).

A challenge however exists to implement mobile technology in different business sectors and make secure payment and transaction using mobile devices.

ORGANIZATION OF BOOK

This book is organized into 15 chapters. The brief description of each chapter follows:

Chapter 1 presents the role of mobile commerce and mobile payment in global business. This chapter identifies the importance of mobile commerce and mobile payment in global business. It has a set of discussion by different authors to provide a theoretical review of mobile commerce. The author uses mobile commerce and technology acceptance model as a validate theoretical model in study of m-commerce adoption.

Chapter 2 establishes the relation between various factors like perceived usefulness, trust, perceived ease of use, demographics and adoption mobile services. The authors make an empirical study and identify the degree of effects of relationship drivers. Base on survey, authors suggest that demographics factors cannot be judged as an important influential factor in adoption of mobile services.

Chapter 3 addresses the strength, weakness, opportunities and threats of mobile commerce. The author contends that in order to make any transaction or implement mobile technology in their business one has to have in depth knowledge of strength and weakness of mobile commerce from consumer perspective and business perspective. This chapter also gives an influential impact of threats in global business environment.

Chapter 4 address the different fraudulent activities that can be made while performing with mobile commerce. The authors classify the frauds in technological and non technological frauds with a brief description of mobile commerce architecture. The author contends that in order to manage the technological related frauds one needs to consider solutions in wider context and take relative measure for the existing fraud and the upcoming fraud.

Chapter 5 reviews the reality of mobile payment system in Latin America. The author compares the mobile payment system in world with Latin America. This chapter describes the social inclusion and exclusion with reference to mobile payment system. The author compares the different mobile payment system and service provider among different nations of Latin America with pros and cons of each method.
Chapter 6 presents a case study of attraction of customers to online shopping using mobile apps. Authors has described the attraction by comparing three leading app of shopping. This case study is of Indian consumers and examines the organizational trust factor, app trust factor and payment related issues.

Chapter 7 reviews the security risks management and its prevention in mobile commerce. The author examines device and application risks and their impact on mobile commerce. This chapter also has different preventive measures and protocols for secure transaction in mobile commerce. The overall aim of this chapter is to consider security risks pertaining to transaction and payment in mobile commerce and providing preventive methods to make secure payment.

Chapter 8 takes the different payment methods used in mobile transaction. The author describes the online payment methods with a brief of stakeholder involved in it, and legal, technical and operational issues related to mobile payment.

Chapter 9 presents the framework of mobile payment. The author compares the regulation and protocols of different countries to make mobile transaction within and outside their nation. The author contends that in order to make a successful use and emergence of mobile commerce in business process, the nation has to maintain a regulatory framework to resolve all technical and legal issues of business process.

Chapter 10 presents an analysis of architecture layers of mobile devices and flow of transaction. The author describes the different mobile transaction models and mode of payments with threats and risks involved in mobile payment system. This chapter describes the issues in mobile database transactions as compared to conventional ACID transactions and security issues in mobile data base.

Chapter 11 describes consumers’ perception to mobile commerce and reasons for the fast growth of mobile commerce. The author systematically reviews the problems faced by consumers in mobile commerce by making a comparison with e-commerce and presents the 7c’s framework to change and improve the perception of consumer towards mobile commerce.

Chapter 12 reviews the barriers or hurdles that come in the way of mobile payment. The author describes the geographical, demographical, technical, legal and other barriers which cause a hurdle in secure mobile transaction.

Chapter 13 discusses the different services of mobile commerce. The author describes the services of mobile commerce in different business areas along with advantages of mobile commerce. This chapter reviews the drivers of mobile commerce in terms of localization, functionality and bandwidth.

Chapter 14 reviews the risks involved in security of mobile payment. This chapter describes the security risks such as device, transactional and technological risks and also provide security solution like encryption, WPKI, Amalgam algorithm and Random LSB Steganography.

Chapter 15 reviews the present position of mobile commerce in developed and developing countries. The author presents the futuristic view of mobile commerce in different application and among different countries. The author contends that in order to make good use of mobile commerce, it should be used in effective and efficiently in every service sector.

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REFERENCES


