

Mobile Banking and Security Challenges

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Abstract: *Banking services have expanded from cash in the bank to internet banking and now mobile banking which attained broad recognition internationally. With help of mobile banking facilitates the customers access their accounts and entire information about bank products and services anywhere anytime through Internet and World Wide Web. The mobile banking is trustworthy, secured and cost effective, nevertheless complex and vulnerable to network problem. Security issues are significant since intruders makes others life as unsafe and miserable. One could be sufferer of a cyber crime in several ways. In this paper an effort is made to study the various security issue, challenges and solutions related to mobile banking services.*

Keywords: Mobile phones, Mobile banking, Cyber crime, Internet, Security.

1. Introduction

Banking services have been a division of society for long a period. The conventional banking services need physical interactions between customers and banks. Though, mobile technology has brought banking services to next level. In recent years, more number of people using banking services and also modern mobile banking services. Mobile banking is one of the gifts to human beings by Information and Communication Technology. The term mobile banking refers to the use of mobile device to access bank account and perform online banking tasks such as checking balances, transferring funds, bill payments etc [11]. Mobile usage has observed an explosive growth in most of the Asian Economies like India, China and Korea. In fact Korea possesses about a 70% mobile penetration rate and with its technical study population has seen one of the most aggressive rollouts of mobile banking services. Still, the main reason that mobile banking scores over internet banking is that it enables 'Anywhere Banking'. Customers no need to access computer terminal to access their banks, they can now do so on the go when they are waiting for their bus to work, when they are travelling or when they are waiting for their orders to come through in a restaurant. Globally, banks offer a variety of mobile banking services; and those banks that do not currently provide m-banking services claim they plan to do so in the near future to remain relevant, according to a recent survey conducted by the Aite Group. According to a study from the University of Hamburg, Germany, m-banking mobile applications are growing exponentially; roughly 69% of banks already offer such services.

A major challenge for the adoption of mobile banking technology and services is the perception of insecurity. In the survey conducted by the Federal Reserve, 48% of respondents cited their main reason for not using mobile banking was "I'm concerned about the security of mobile banking". In the same study, respondents were asked to rate the security of mobile banking for protecting their personal information and 32% rated it as somewhat unsafe and very unsafe, while 34% were

not sure of the security. These statistics represent a significant barrier to the use of mobile banking products and services.

In this paper mobile banking services, challenges in mobile banking, cyber crime and solutions are analyzed. The rest of this paper is organized as follows. Section 2 offers literature review of mobile banking, section 3 explains about the role of mobile phones in daily routine life and mobile banking services, section 4 presents the cyber crime problems with mobile banking. The importance of mobile banking security and preventive measures for mobile banking are illustrated in section 5 and section 6 concludes this paper.

2. Literature Review

The Internet is one of the biggest blessings to manhuman society by technology. One just cannot imagine the life without the internet. Everyone wants to stay connected with the Internet all the time through the mobile phones easily. The mobile phones let users enjoy the social media on the go. A major part of modern world is addicted to social networking sites. The growth of every economy depends on various sectors like agriculture, manufacturing, education, technology, finance etc. Emerging and fast growing innovations in information technology and globalization have changed the whole process of service providing organizations. Innovative information technology is the backbone of economic development of any country. Globalization, competitive pressure, and technology advancement change the whole process of banking industry.

Now a days, the information and communications technology have undergone through rapid development. In addition to that the revolution of wireless technology and the intensive penetration of mobile phones have encouraged banking industries around the world and to invest considerably large budget on building mobile banking systems, through the adaption of different kinds of strategies with the aim of attracting customer intention to use this new technology [19], [21]. Consequently, the most popular banking systems that can

be offered to customers are internet banking and mobile banking systems, which allow customers to perform their banking transactions [20]. Garrett has indicated that mobile banking is the present and future need, parallelly security is a major issue [9]. Vaithilingam, Nair and Guru have investigated that the adoption of mobile services in Malaysia and found trust and security has a significant impact on the adoption of mobile banking [15].

Amit Shankar and Pooja Kumari have been carried out to know major factors which affecting mobile banking adoption behaviour in different context. Secondly, quantitative investigation is provided to support stated hypothesis. Thereafter, results of reliability and validity test of constructs are provided [22]. Sultan Y. As-Sultan, Ibrahim Ahmed Al-Baltah, Fua'ad Hassan Abdulrazzak have conducted study to analyze the most well-known and accepted models to provide a comprehensive understanding of their impacts toward the adoption of mobile banking applications. In addition to that the study exploring the most effective factors that have been used to influence the goal of adoption behavior of mobile banking applications and suggested some recommendations for security of mobile banking[23].

3. Mobile Banking

3.1 Role of Mobile Phone

Mobile phones are playing vital role in daily walk of life of large percentage of the world population. Communication technology has left no aspect of human life untouched. Even our morning alarm clocks have been replaced by the mobile phones. Mobile phones have become a necessity for many people throughout the world. The ability to keep in touch with family, business associates, and access to email are only a few of the reasons for the increasing importance of mobile phones. Today's technically advanced cell phones are capable of not only receiving and placing phone calls, but storing data, taking pictures, and can even be used as walkie talkies, to name just a few of the available options.

The enlarged uses of smart phones has increased demand for m-banking services, prompting many more banks, microfinance institutions, software houses, and service providers to offer this innovative service together with new sets of products and applications designed to extend their client reach, improve customer retention, enhance operational efficiency, increase market share, and provide new employment opportunities[14]. Large types of mobile phones and different operating systems are also a big challenge for banks, as it is very difficult for them to provide standardized applications. Convenience and security are two main factors which can motivate other non-user to use technology based banking services [5].

3.2 Importance of Mobile Banking

Mobile banking is the latest and most innovative service offered by the banks. Mobile Banking is considered as a mechanism which allows customer of a financial institution to carry out various financial transactions with the help of their mobile devices, such as Smart phones, notebooks or tablets. With the increasing use of smart phone mobile banking is catching up with the common customer [14]. Mobile

connectivity is vast and this makes mobile banking very successful. The clients access their mobile banking facility from a browser or a special application, enabling to view their account balance, send remittances and perform most other functions also available in standard e-banking facility. Many experts say that mobile banking offers many benefits worth using, and some are getting increasingly better. Information technology has been exercised under two different paths in banking. One is communication and connectivity and other is business process [3], [7].

At present, banks have received wireless and mobile technology into their assembly room to offer their customers the freedom to pay bills, planning payments while stuck in traffic jams, to receive updates on the various marketing efforts while present at a party to provide more personal and intimate relationships. Mobile devices are integrated with multiple wireless communication technologies such as Wireless Fidelity(Wi-Fi), Worldwide Interoperability for Microwave Access (WiMAX), Bluetooth, Near Field Communications (NFC), and a cellular interface which are configured to use CDMA or GSM network schemes[7], [8]. Mobile banking functionality can be divided into three main areas such as

- (i) Informational Functions,
- (ii) Transactional Functions and
- (iii) Service, Marketing and Acquisition [17].



Figure 1: Mobile Banking Architecture

Owing to growth of Information and Communication Technology the unethical hackers and anti-social elements are interested to penetrate the online payments and money transfer. The confidential information such as user name and password must be maintained in secured manner to avoid vulnerable and threats. Most of the banks try to make their sites secured by implementing latest network security software. The eminence of online banking services has become a major region of attention among researchers and bank managers owing to its strong impact on business performance, profitability and customer service delivery.

Mobile Banking Service include:-

- i). Mini statement.
- ii). Monitoring of Term deposits.
- iii). Ordering Cheque books.
- iv). Balance checking in the account
- v). Change of Pin.
- vi). Blocking the lost ATM card.
- vii). Fund Transfer.
- viii). DTH Recharging.
- ix). Purchasing ticket for a movie or travelling.

Mobile banking services are being offered through many channels such as Short Messaging Services (SMS), Interactive Voice Response (IVR), Mobile Application, and Wireless Application Protocol (WAP), etc. Banks are taking advantages of mobile innovation to provide its services to customers economically and profitably. The introduction of m-banking helps banks to perform its activity efficiently which lead to consumer satisfaction and loyalty [3], [7].

3.3. Development of Mobile Banking Apps

Mobile banking apps has a short development history. Most mobile banking service was offered over SMS banking up to 2010. Since 2010, with the success of iPhone and lightning growth of Google Android, more banks started adapting a new trend by launching mobile web based service and mobile banking apps. According to a mini study by Mapa Research in 2012, upon a third of banks have their mobile detection on their main site. Among the result, 61 percent of the mobile optimized website has an option to download mobile banking apps. Mobile banking apps is specifically designed for smart phone and tablet, which run on OS.

Mobile banking apps is able to download from application stores. Similar to online banking, mobile banking apps connect directly from customer's device to bank server via internet connection, including Wi-Fi, 3G or data transfer, for complete banking functionality[10]. When mobile phones turned into smartphone, and began to mimic the power found in most computers, banks have been able to provide consumers with powerful mobile banking apps that allow customers to complete their banking from wherever you are. This includes making deposits, depending on the bank and its mobile app checking funds, making bill payments, transferring or sending money.



Figure 2: Mobile Banking Apps

Latest all banks mobile apps launched in 2017.

- i). Instant Money Transfer (IMT) – **Bank of India**
- ii). Kisan card – **AXIS BANK**
- iii). Maha Millionaire”, “Maha Lakhpati” – **Bank of Maharashtra**
- iv). M-Pesa – **ICICI + Vodafone**
- v). M-Wallet – **Canara Bank**
- vi). State Bank Freedom App – **State Bank of India**
- vii). Student Travel Card – **ICICI**
- viii). TAB BANKING FACILITY – **SBI**
- ix). Tap and pay – **ICICI**
- x). Twitter Handle account – **SBI**
- xi). Video conferencing – **Indusuld & federal bank**
- xii). Youth for India – **SBI**
- xiii). First home grown INDEX “COMPOSITE INDEX” – **SBI**
- xiv). IMobile app for windows phone – **ICICI**
- xv). India’s first” transparent credit card “in association with American Express – **ICICI**
- xvi). India’s first credit card exclusively for GOLF – **RBL Bank**
- xvii). Instant money transfer – **BOI**
- xviii). Kotak Bharat’ mobile banking app - **Kotak Mahindra Bank (KMB)**
- xix). ‘Saras Rural Housing Loan’ Scheme - **ICICI Bank**
- xx). Awareness initiative ‘Dhanchayat - **HDFC Bank**
- xxi). UPI App That Turns Your Smartphone into a Bank for Easy Transfers – **RBI**
- xxii). SBI launches ‘State Bank of India No Queue’ Mobile App – **State Bank Of India**
- xxiii). ICICI Bank launches ‘ICICI Appathon’, a Mobile App – **ICICI Bank**
- xxiv). Lakshmi Vilas Bank launches ‘LVB Mobile’ app – **Laxmi Vilas Bank**
- xxv). IMT APP (Instant Money transfer) Launched By – **State Bank Of India**
- xxvi). Ananya Project launched By – **Syndicate Bank**

3.4. Pros and Cons of Mobile Banking

3.4.1. Pros of Mobile Banking

- i). Mobile Banking uses the network of service provider and it doesn't need internet connection. In a developing countries like India where there is no internet connection in the interiors there is the presence of mobile connectivity.
- ii). Mobile Banking is available round the clock 24/7/365 and is easy and convenient mode for many mobile users in the rural areas.
- iii). Mobile Banking is said to be more secured and risk free than online/internet Banking.
- iv). With the help of mobile banking you can pay your bills, transfer funds, check account balance, review your recent transaction, block your ATM card etc.
- v). Mobile Banking is cost effective and Banks offer this service at very low cost to the customers.

3.4.2. Cons of Mobile Banking

- i). Though the security threat is less than internet banking, mobile banking has security issues. One of the great threats to mobile banking is "Smishing" which is similar

to "phishing". In "Smishing" users receive fake messages asking for their Bank details. Many users have fallen to this trap.

- ii). Mobile Banking is not available on all mobile phones. Some time it requires you to install apps on your phone to use the Mobile Banking feature which is available on high end smartphones. If you don't have a smartphone then the use of Mobile Banking becomes limited. Transaction like transfer of funds is only available on high end phones.
- iii). Regular use of Mobile Banking may lead to extra charges levied by the bank for providing the services.
- iv). Mobile phones are limited in processing speeds, screen size and battery life. This acts as a barrier in Mobile Banking.

Like all other technology mobile banking has got its advantage and disadvantage and it's up to users and how they utilize the technology. However there is no doubt that mobile banking is taking part significant role in every day banking activities.

4 Cyber Crime

Cyber crime is defined as a combination of crime and computer or "any offence or crime in which a computer is used is a cyber crime". Many countries face difficulties in addressing issues arising from cyber crimes, because they lack a concrete definition of computer crimes and how such crimes differ from traditional crimes [2],[12]. Cyber Crime is a technique that employs ICT components like computer and communication equipments etc. to harm the individual, trade, government and ICT infrastructure. Schell and Martin define cyber crime broadly as "a crime related to technology, computers, and the Internet" [1], [4]. Cyber security experts suggested that the cyber-attacks against financial services institutions are becoming more frequent and more sophisticated [16], [18].

The weak and rigid authentication provided by signature, PIN, pass-word and card security code in mobile banking has numerous flaws and loop-holes [6]. Join Tom Wills, renowned expert in global mobile trends, for insights into how global banking institutions can navigate the mobile threat landscape, including:

- i). Emerging external threats to mobile banking and payments;
- ii). How to influence the riskiest wildcard user behaviour;
- iii). Anti-fraud solutions and strategies to prevent mobile attacks and maintain customer trust.

Cyber attacks are classified into several types [13]. They are

- i). User based / against a Person
- ii). Property based cyber crimes
- iii). Society based cyber crime
- iv). Private Organizations based
- v). Government based cyber crime.

5 Mobile Banking Security

Security is the foundation for the development of mobile banking. Only when the security is fully shielded, the mobile banking can deal with other traditional banking business

activities. The security and privacy of personal information remain common concerns for mobile phone users, and many smartphone users reported taking steps to guard against possible risks. Even the Reserve Bank of India (RBI) that is the main body, has been issuing various directions and recommendations from time to time to strengthen cyber security of banking operations in India.

5.1. Preventive Measures for Cyber Crime

In order to protect banking transactions from frauds and other threats, some preventive measures are suggested. They are

- i). Make sure with a protection program that gives power over cookies that forward information back to Web sites.
- ii). Bring into play latest anti-virus software, operating systems, Web browsers and email programs
- iii). Place firewall and develop your content off line.
- iv). Forward credit card information just to safe and sound web sites
- v). If Web site serves up active content from a database, consider putting that database behind a second interface on your firewall, with tighter access rules than the interface to your server.
- vi). Activate your mobile device's code lock
- vii). Only use the most up-to-date system version of your mobile device
- viii). If possible, use up-to-date virus protection software and a personal firewall
- ix). Turn on Blue Tooth or enable Internet only when required.
- x). Do not turn off the wireless connections when not needed.
- xi). Regularly update the cell phone software.
- xii). Install latest Anti Virus Software, and keep it updated.
- xiii). Use strong passwords to lock your cell phone.
- xiv). Never share personal information with stranger
- xv). Never store personal banking details in cell phones.
- xvi). Be suspicious while entertaining strangers on social networking website.
- xvii). While banking and shopping online, ensure the sites are https or shttp.

6 Conclusion

Security around the transfer of data through communication channels is a challenge for developers, they noted, pointing out that developers are placing too much confidence in secure end-user behavior and back-end server-side communications. Even now many customers are uncomfortable with online banking regarding with security. In addition to that cyber criminals are trying day by day to find new techniques to avail unauthorized access to finances of financial institutions, banking customers.

In developing countries, electronic crime is a serious problem because there is a lack of training on the subjects to investigate the electronic crime. Precaution is the only way to maintain secured transactions in this mobile banking system. There is a need to bring changes in the Information Technology Act to make it more effective to fight cyber crime. Mobile banking services play a significant role in improving customer satisfaction in high level and it has its own impact on customer satisfaction.

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