Mobile Banking - Financial Services Technology

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Abstract - The mobile and Internet market has been one of the fastest growing markets in the world and it is still growing at a rapid pace. This opens up new markets for financial institutions interested in offering value added services with reduction in cash usage and its associated costs. With mobile technology, banks can offer a wide range of services to their customers, transfer funds between accounts and will have immediate and full control over their finances or even performing stock trading while being in traffic. Mobile devices, due to their ability to provide services anytime and anywhere, have a high rate of penetration and potential to grow. This paper describes the basic concepts, services offered and technology which enables Mobile Banking.

I. INTRODUCTION

The first initiatives to enable direct payment via the computer network have emerged in the late seventies and early eighties. The appearance of the Internet significantly influenced further development. Internet network has rapidly grown from its modest appearance in the late seventies until the present times. Since January 1997 until today, after a period of exponential growth, the number of machines related to the network has exceeded one billion. This growth was mainly influenced by the appearance of the World Wide Web technology that provides access to the information stored on machines around the world, with a simple method highlight and click. The number of the Internet pages has also grown rapidly.

The number of views of the Internet users shows that the users' profiles quickly changed from the original users, university centers to the widespread population. These facts have not been missed even by the commercial organizations that offer the selling of goods and services to almost everybody. There are various systems of payment, but also various habits of people. One of the tasks set by the researchers was to incorporate the existing payment systems into electronic systems. The main advantage for the customer is the possibility of deferred payment [1].

A large number of mobile payment varieties exist in the market. Internet Banking is one of the services that give the customer's access to their banks. Customers could anytime: check out of their account details, get their bank statements, perform transactions like transferring money to other accounts and pay their bills. Internet banking requires a computer device (mostly PC) with enabled Internet connection. Mobile banking solve this limitation of Internet Banking, as it reduces the customer requirement to just a mobile phone. Mobile Banking enables anywhere, anytime banking. Customers overcome the limitations of Internet Banking, now they can do so on-the-go.

II. MOBILE BANKING

Many consumers and even some number of bankers make the mistake of using terminology mobile banking vs. mobile payments interchangeably. Mobile Banking refers to the platforms that enable customers to access financial services such as fund transfers, bill payments, balance information and exploring investment options. Mobile payments are defined as the process of using a hand-held device (such as mobile phone for example) to pay for products or service, remotely or at POS terminal [2].

With the advent of smart phones, communication to customers is not limited to voice only. This technology has given way to multi-functional wireless infrastructure that is available to the customers at all times, thus becoming a key driver for mainstream adoption of mobile financial services. Today's generation mobile phone becomes a companion in life, thus the adoption of mobile banking has taken off. This group will grow in the next decade giving banks an opportunity to explore innovative services at a reasonable cost. In developing regions with the increasing awareness of technology, the user acceptance of new technology is going high. Benefits of increasing penetration of telecommunication and anytime reach, will lead to mobile-based business models proving instrumental in realizing branchless banking, taking it to higher grounds by enabling low cost, and real time transactions over secure networks [3].

The main reasons behind low penetration of banking have been shown on Fig. 1.

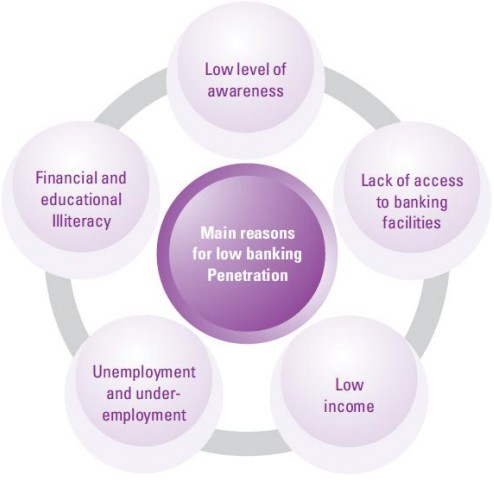

Figure 1. Overview of the main reasons for low banking breach (Source: Technology enabled transformation in Banking - KPMG 2011)

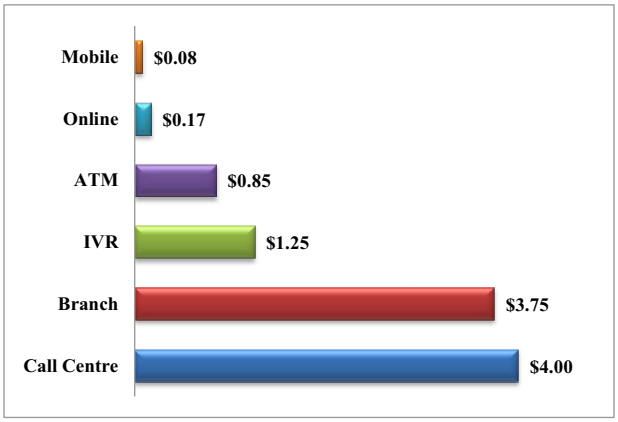

Figure 2. Transaction costs by banking channel
(Source: Tower Group, Fiserv, Mcom data, 2009)

High mobile penetration and limited banking facilities are driving the growth of mobile banking in developing regions. The mobile services platform is a huge opportunity for banks to offer innovative banking and payment services. Around the world, retail and commercial banks are rapidly deploying an array of mobile banking solutions aimed at customer convenience and cost reduction. Cost transaction by various banking channel is depicted on Fig. 2.

Based on survey of Western European bank executive, most large banks and many mid-sized banks already offer various form of mobile banking service. Nearly two thirds of respondents either to that survey indicated that mobile banking was already mainstream or on the verge of gaining major traction in their market [5]. Mobile banking is often a relatively straightforward proposition for retail banks. The new channel can be built at relatively low cost and risk by adapting existing Internet platforms to mobile devices. In addition, with little to no incremental costs for each additional mobile user, the financial justification for basic mobile banking services is easy to rationalize.

Mobile banking has also started to see widespread customer adoption, with a number of respondents indicating noticeable drops in telephone and internet banking inquiries accompanied by increased mobile application download rates and text inquiries. Most banks provide basic information services such as balance updates, payment alerts and account transfers. Mobile banking is must for banks that focus on customer services and innovation as key differentiators. Families and early-adopted customer are segments which increasingly using mobile devices to manage all aspects of their daily lives and are looking to their banks to provide a similar level of access to their financial information through their mobile devices. In addition, largely as response to growing consumer demand, many respondents suggested that they expected to gain competitive advantage and differentiations as key benefits of their mobile banking solution [5].

III. Financial Services and Technology

Most large banks offer a basic mobile banking solution for their consumers. The most common mobile banking services available are:

- Account alerts, security alerts and reminders
- Account balances, updates and history
- Customer service via mobile
- Branch or ATM location information
- Electric bill, deliver online payments by secure agents and mobile client applications
- Domestic and international funds transfers
- Transaction verification
- Insurance policy management
- Pension plan management
- Mortgage alerts
- Blocking of (lost, stolen) cards
- Withdrawal at banking agent
- Deposit at banking agent
- Mobile recharging
- Peer to Peer payments

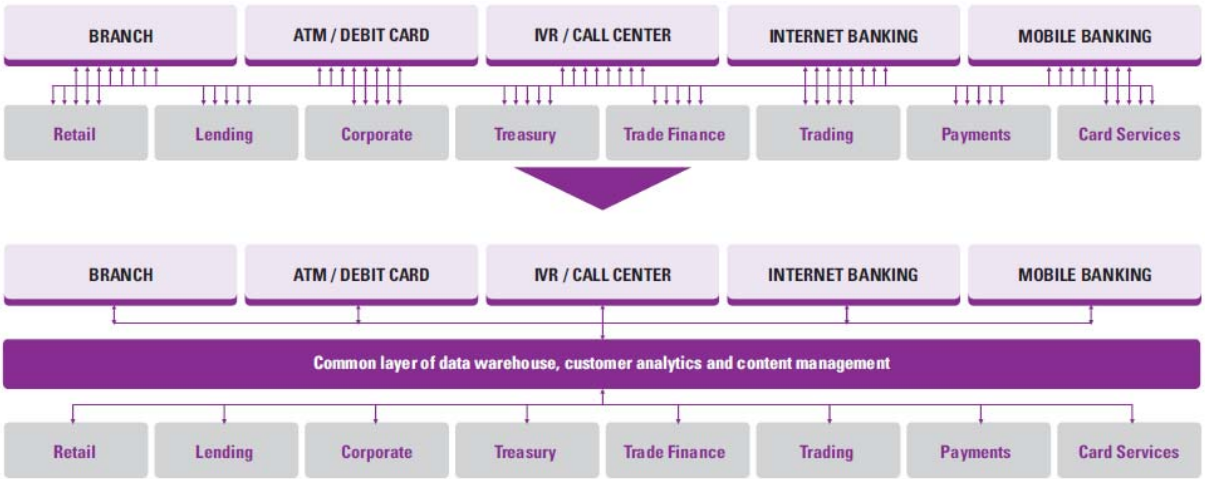

Figure 3. Transition of service channel
(Source: Technology enabled transformation in Banking - KPMG 2011)

Future services likely will include mobile commerce, mobile payments, contactless payments using NFC (Near Field Communications), mobile coupons and location-based services [7].

Retail banks are faced with the challenges of shrinking product margins and growing customer demand for more personalized service. Banks are forced to consider innovative customer sales and service strategies (depicted on Fig. 3), which requires a much broader approach to the management of the many services that customers may use to interact with their bank. Banks are typically trapped between the perplexities of allowing the customer to choose among a wide variety of services deciding.

There is a significant difference between launching mobile services in the developed world and the developing one. According to the UK Department for International Development, more than 2.7 billion people in the developing world have no access to financial services. What's more, the same study suggests that by 2012, there will be 1.7 billion people with access to mobile phones but not bank accounts. Large proportion of the developing world is currently, unbanked, financial institutions generally do not have access to robust customer information, which in turn reduces service options, particularly in the extension of credit facilities [6]. Mobile phones in developing world also tend to be less advanced, meaning that WAP and mobile application-based solutions are not universally applicable in all markets.

Banking innovators are also confident that their mobile banking leadership will translate into greater customer loyalty, satisfaction and a stronger reputation for customer centricity. Banks are adopting their mobile applications and browser platforms to deliver targeted advertisements and promote cross-selling opportunities. Banks are also building customer acceptance and comfort with conducting financial transactions over mobile devices. This procedure banks create a larger group of early adopters for future mobile services.

Mobile banking and mobile payments can take many forms. The development of mobile solutions tends to follow an evolutionary pattern that starts with basic mobile banking and progresses towards mobile payments at the physical POS. Scenarios in Table I examine some of the impacts, benefits, challenges and customer considerations facing banks at three distinct points in this evolution.

TABLE I. SCENARIO SPECTRUM FOR MOBILE TECHNOLOGY [5]

	Basic mobile banking	Enhanced mobile banking and remote mobile payments	Mobile payments at the physical POS
Overview	The basic mobile banking market consists of financial institutions that are focused on developing and refining their mobile banking platform	The enhanced mobile banking and remote payments market consists of players with mature mobile offerings, healthy adoption rates, and basic remote payment services	The physical POS mobile payments marketplace is composed of traditional and non-traditional players vying for early market share of mobile payment revenues
Key features	Typically includes core service offerings such as account access, balance information and internal transfers and are usually on 1-2 technology platforms serviced by a vendor	Typically consists of market leading mobile banking features such as mobile deposit capture, mobile capture and bill pay, enhanced enrollment features, and some remote payment offerings such as person to person (P2P) payments	Features and functionality widely vary depending on the players involved and geography where the solution is being launched
Benefits	• Enhanced reputation and customer service • Reduced cost to serve (and therefore more flexible capital) • Can be straightforward to deploy • Easily integrated into existing internet banking services • Demonstrates innovation • Creates a base comfort level for consumers using mobile devices • Builds in-house experience and skills	• Reduces cost to serve and increases available capital • Streamlines processes and reduces manual intervention • Builds in-house experience and skills • Capitalizes on 'first-to-market' opportunities • Provides new revenue streams	• Protects existing payments revenues • Creates new revenue opportunities • Responds to customer demands
Customer impact	• Unfettered access to banking information and basic transactions • Convenience and ease of use • Integrated view of banking information and accounts • Higher customer loyalty and 'stickiness'	• Reduces branch and ATM visits • Delivers increased flexibility to customers • Builds comfort and acceptance of mobile payment solutions • Acts as a stepping stone to contactless and proximity payments	• Convenience and ease of use, particularly for low-value payments • Tighter security and privacy • Replaces traditional wallet or existing stored value accounts and electronic purse cards
Key considerations	• What is our mobile channel strategy? • What is our mobile commerce strategy? • What is our position on mobile payments? • What are our current mobile banking capabilities?	• Who is our mobile service vendor and are their capabilities sufficient? • What are leading practices in mobile commerce? • What should our mobile payments product look like? • What should our revenue sharing model look like?	• How should we plan for enhancements to our mobile platform? • How should we rollout our mobile payments pilot? • What are the estimated costs of the mobile payments initiative?

Banks can use services and technology to achieve customer satisfaction [4]:

- **Transparency** – Complex products such as top up deposits, revolving loans, top up loans, etc. introduced by the Banks to benchmark themselves in the competitive market and provide the best possible deal, leaves customers confused with the choices. Customers regularly indicate the penalization for being loyal or introduction of unfair or unexpected changes. Banks can rebuild trust by undertaking the research through myriad data analytics solutions to better understanding customer's needs. This will help them to build right relationships with the customers and provide for focused products/services participation in social networks to.
- **Unique identity and sense of belonging** – Most Banks are not able to harness the capabilities of the system to meet today's needs effectively and may not meet tomorrow's 24/7 banking requirements. This reduces the ability to launch unique products. Banks can create a brand identity by offering improved service levels, transparency, quality of staff, and relevant information to the existing and new customers. This will develop long lasting relationships with the customers who will perceive it as full-service provider and thus recommendation to other potential customers.
- **Reaching customers and cost reduction** – Banks usually struggle in frequent communication with the customers. Primary mode as used by Banks to share information with their existing customers is the websites and the mailers. However, Banks can use blogs and customers and in decision-making allow customers to discuss the offerings, compare and evaluate services. Banks can also arrange the weekly meeting with the potential and existing customers to offer various financial facilities offered by the Bank. Feedback from customers will help the Bank in redesigning their products and thus provides an interface to sell these products via online channels. New technologies can help the Banks in reducing the cost of the operations such as per unit product cost, infrastructure maintenance and increasing the frequency of communication with the customers. Banks are attempting to cater to all customer segments through same delivery channels. The focus can be enhanced by redefining the strategy to use hybrid channels (kiosks, franchisees, etc.)
- **Response to regulatory regulations and reporting requirements** – Analytics using IT can help the Banks to focus on the products/service offering to the on what should be done as per the regulatory guidelines. Successful integration will help in decision of what risk Bank wants to take, understanding and measurement and finally right pricing of the products

IV. MOBILE BANKING SECURITY THREATS

Mobile banking has been mostly performed via SMS or the Mobile Web. The rapid growth of smart phones based on operating systems like Apple's IOS or Google's Android have led to increasing use of special client programs, called apps. These applications can be downloaded to mobile device. For additional security protection client install a digital certificate from a trusted certificate authority (CA). Installing a certificate from a CA is an important step in ensuring that mobile phone is a trusted entity within mobile network infrastructure.

Financial institutions should be aware of potential threats that can affect their mobile banking services. These include [2]:

- **Cloning** – Copying the identity of one mobile phone to another, thereby allowing the perpetrator to masquerade as the victim, normally with the intent to have calls and other services billed to the victim's cellular account. In the case of mobile banking, cloning could give the hacker access to the victim's financial accounts;
- **Hijacking** – The attacker takes control of a communication between two entities, masquerading as one of them. As with cloning, hijacking could give the hacker access to the victim's financial accounts;
- **Malicious Code** – Software in the form of a virus, worm or other "malware" is loaded onto the handset, the SMS gateway or the bank's server to perform an unauthorized process that will have adverse impact on the confidentiality, integrity or availability of financial information and transactions;
- **Malware** – A contraction for "malicious software" that is inserted into a system, usually covertly, with the intent of compromising the confidentiality, integrity or availability of the victim's data, applications or operating system, or otherwise annoying or disrupting the victim;
- **Man-in-the-Middle Attack** – An attack on the authentication protocol exchange in which the attacker positions himself between the claimant and verifier with the intent to intercept and alter data traveling between them;
- **Phishing** – Tricking a victim into disclosing sensitive personal information or downloading malware through an email;
- **Redirecting** – Intercepting a communication by substituting a fraudulent address or identity, potentially by using a Man-in-the-Middle attack;
- **SMiShing** – A contraction of "SMS phishing," this attack uses SMS to facilitate bogus requests for personal information;
- **Spoofing** – Sending a network packet that appears to come from a legitimate source, rather than its actual source;

- **Vishing** – A contraction of "voice and phishing", in which victims are tricked into disclosing sensitive personal information through a phone call;

V. CONLUSION

In the financial institutions, a key factor for a success is the responsiveness of the user. Any system that is supported by the famous banking organizations, will easily win the trust of its users. Innovative models using mobile devices and efficient payment systems will make financial services more widely available anytime. It is becoming more and more critical to develop new intelligence that enables financial institutions make informed judgments and become much more customer centric. Smarter banks will increasingly invest in techniques to gain new customer insights, effectively segment their customers, develop deeper relationships and be the bank of choice. Banks will be increasingly using technology that will enable them to determine pricing, new products and services, the right customer approaches and marketing methods, which channels customers are most likely to use and how likely customers are to change providers or have more than one provider. Banks that will understand their customers better and look to charge only for services used will benefit more than other banks. We may conclude that every aspect of banking will be transformed by new technology in near future. Customer-friendly products, delivery channels, easy and accessible services and competitive pricing would be the driving forces – and technology shall play a dominant role in all these. The most successful institutions will be those that combine visionary technology with strong customer centricity.

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