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Mobile Banking Services as Adoption and Challenges: A Case of M-Banking in India (Positive and Negative impacts, Mobile Growth in India, Adoption Models and Mobile Technology)

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Abstract- This paper identifies and investigates the factors which influence customers decision to use a specific form of mobile banking, and specifically focuses on the evaluation of SMS-based mobile banking in India. Other my study plans to connect the gap of research in the acceptance of mobile banking among the customers. Main challenges are what are the Positive and Negative factors which influence the adoption of SMS-based mobile banking? Second is Focus on the adoption of mobile banking services by customers and usage of mobile banking in India. Third is Different Technologies behind Mobile Banking. Although the study has its limitations, the implications of the results allow providing practical recommendations to the banking areas, banking industries and directions for further work.

Index Terms- SMS, Mobile Banking, IVR, WAP

I. Introduction

Mobile banking is an application of mobile computing which provides customers with the support needed to be able to bank anywhere, anytime using a mobile handheld device and a mobile service such as Short Message Service (SMS). Mobile banking facility removes the space and time limitations from banking activities such as checking account balances or transferring money from one account to another and time saving when we go to bank and doing some banking activities.

Internet Banking helps give the customer's anytime access to their banks. Customer's could check out their account details, get their bank statements, perform transactions like transferring money to other accounts and pay their bills sitting in the comfort of their homes and offices. But the biggest limitation of Internet banking is the requirement of a Personal Computer with an Internet connection, but definitely a big barrier if we consider most of the developing countries of Asia like India. Mobile banking addresses this fundamental limitation of Internet Banking, as it reduces the customer requirement to just a mobile phone. Mobile usage has seen an explosive growth in most of the Asian economies like India. The main purpose of Mobile Banking scores over Internet Banking is that it enables 'Anywhere Anytime Banking is Available'. Customers don't need access to a computer terminal to access their bank accounts.

II. Mobile Banking Adoption and Challenges in India: Positive and Negative, Impacts, Mobile Banking Services, Mobile Growth, Adoption Models and Mobile Technologies

Financial Services are generally complex and need a lot of trust for the consumer to use technology. Banks have changed from paper-based banking solutions provider to the latest of the technologies like online-banking, mobile-banking, etc. Customers across the world, even technologically optimists, have refrained from using technology aided solutions. There are many reasons why technology has not been able to ride the acceptance wave and cross the hurdle and become an acceptable feature in banking. As today's banking has redefined itself as customer centric, it becomes more important that the customer is happy with the services being provided. Unfortunately, the acceptance and adoption rates are very low even in the case of educated customers. The paper looks at various factors which explain why consumers are not using mobile banking and other technologies in banking. It would also try to suggest why people are not currently using mobile banking and try to suggest how to overcome this problem and increase the acceptance levels.

Mobile Banking where banks provide these following services:

Account Details: - define the information related to accounts and following are the main services of accounts.

a) Mini-statements and checking of account history
b) Alerts on account activity
c) Monitoring of term deposits
d) Access to loan statements/card statements
e) Mutual funds / equity statements
f) Insurance policy management
g) Pension plan management

Payments and Transfers: define the information about the payments and transfers activities like bill payment process.

a) Domestic and international fund transfers
b) Micro-payment handling
c) Mobile recharging
d) Commercial payment processing
e) Bill payment processing

Investments Details: define the information related to investments services.

a) Portfolio management services
b) Real-time stock quotes
c) Personalized alerts and notifications on security prices Support
d) Status of requests for credit, including mortgage approval, and insurance coverage
e) Check (cheque) book and card requests
f) Exchange of data messages and email, including complaint submission and tracking

Content Services: define the information related to Location based and weather like updates**.**

a) Loyalty-related offers
b) Location-based services
c) General information such as weather updates, news

Technologies behind Mobile Banking

Mobile Banking is being deployed using mobile applications developed on one of the following these emerging technologies.

IVR – Interactive Voice Response

IVR Technology used in Banks: - Interactive Voice Response service operates through pre-specified numbers that banks advertise to their customers. Customer's make a call at the IVR number and are usually greeted by a stored electronic message followed by a menu of different and multiple options. Customers can choose any options by pressing the corresponding number in their keypads, and then read the regarding information, mostly using a text to speech program. Mobile banking based on IVR has some main limitations that they can be used only for Enquiry based services. Also, IVR is more costly as compared to other channels as it involves making a voice call which is generally more costly than sending a text message or making data transfer .One way to enable IVR is by deploying a PBX system that can host IVR dial plans.

Banks looking to go the low cost way should consider evaluating Asterisk, which is an open source Linux PBX system SMS uses the popular text-messaging standard to enable mobile application based banking. The way this works is that the customer requests for information by sending an SMS containing a service command to a pre-specified number. The bank responds with a reply SMS containing the specific information. For instance, if any customer wants to gets any information regarding his/her account balance. Customer can use a handheld mobile and customers of the AXIS Bank in India can get their account balance details by sending the keyword 'AXISBAL' and receive their balance information again by SMS.

There are other services of IVR-

a) Bank and stock account balances and transfers
b) Surveys and polls
c) Office call routing
d) Call center forwarding
e) Simple order entry transactions
f) Selective information lookup (movie schedules, etc.)
g) Mobile — Pay-As-You-Go account funding; registration; mobile purchases
h) Banking — balance, payments, transfers, transaction history
i) Retail & Entertainment — orders, bookings, credit & debit card payments
j) Utilities — meter readings

Travel — ticket booking, flight information, check-in
Weather forecasts, water, road and ice conditions

SMS (Short Messaging Service)

SMS Banking initiatives permit you to access your Bank accounts and carry out various banking transactions and Services. If you have a mobile phone, you can use the SMS facility and conduct the following operations using the messaging services of your service provider.

a) Balance Enquiry
b) Last Few Transactions
c) Cheque Paid Status
d) Suspend ATM / Debit Card
e) Loan Balance Enquiry
f) Deposit Service

Here, we are introducing SMS Banking to all our customers. Presently SMS Alert facility is free to the customers. There are two types of services available namely SMS PUSH Alerts and SMS PULL Alerts. There are different types of PUSH Alert services. SMS Banking sends many alert facilities to customers. if any customer facing some following situation than SMS provide following Services.

a) To send an alert when the account balance goes above the maximum balance specified by the customers.
b) To send an alert when the transaction amount credited is Rs. 5,000 and above or the amount specified by the customer, whichever is higher.
c) To send an alert when the transaction amount is debited.
d) To send an alert when a cheque is bounced.
e) The send an alert when the outstation cheque is realized.
f) To send an alert when a cheque deposited by the customer gets returned un paid.
g) To send the end of day balance of the specified account given by the customer (CA / OD / CC).
h) To send reminding alert seven days before the maturity of the term deposit accounts (Amount may not be mentioned).
i) To send reminding alert seven days before the installment due date for the loan accounts (Amount may not be mentioned).

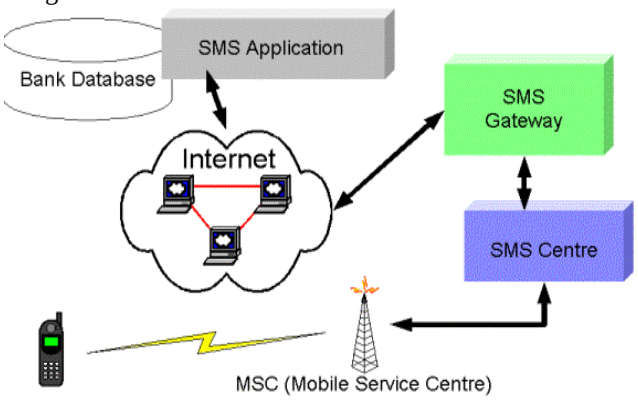
Pull Alert Services are:

a) Account balance enquiry
b) Mini statement request
c) Electronic bill payment
d) Transfers between customer's own accounts, like moving money from a savings account to a current account to fund a cheque
e) Stop payment instruction on a cheque
f) Requesting for an ATM card or credit card to be suspended

g) De-activating a credit or debit card when it is lost or the PIN is known to be compromised
h) Foreign currency exchange rates enquiry
i) Fixed deposit interest rates enquiry.

If any customer wants to registration process then Customers have to submit the application form by giving their mobile number, account number and alert details. The customer has the option to choose or not to choose the different alerts available.

An SMS based service is hosted on a SMS gateway that further connects to the Mobile service providers SMS Centre. This Figure shows:

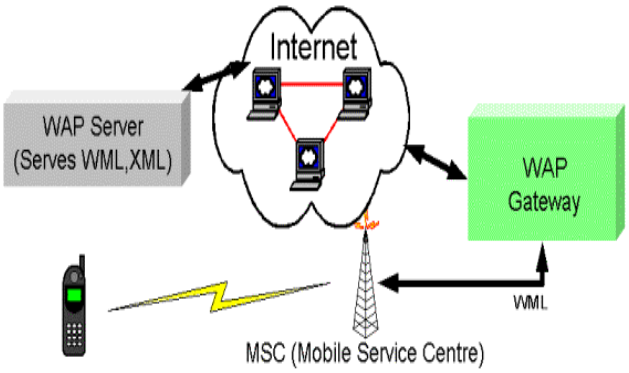


WAP – Wireless Access Protocol

To bridge the gap between the mobile network and Internet.WAP is a global standard produced by WAP forum founded in 1997 with the help of Nokia, Ericsson, Motorola and Unwired Planet. There are two different editions: WAP 1.x and WAP 2.x Banks maintain a WAP site which is similar is internet banking. Which customer's access using a WAP compatible browser on their mobile phones. WAP sites provide the familiar form based interface and can also implement security quite effectively.

The banks customers can now have an anytime, anywhere access to a secure reliable service that allows them to access all enquiry and transaction based services and also more complex transaction like trade in securities through their phone A WAP based service requires hosting a WAP gateway. Mobile Application users access the bank's site through the WAP gateway to carry out transactions, much like internet users access a web portal for accessing the banks services.

The following figure demonstrates the framework for enabling mobile applications over WAP. The actually forms that go into a mobile application are stored on a WAP server, and served on demand. The WAP Gateway forms an access point to the internet from the mobile network.



Standalone Mobile Application Clients

Standalone mobile applications are the ones that hold out the most promise as they are most suitable to implement complex banking transactions like trading in securities. They can be easily customized according to the user interface complexity supported by the mobile. In addition, mobile applications enable the implementation of a very secure and reliable channel of communication.

One requirement of mobile applications clients is that they require to be downloaded on the client device before they can be used, which further requires the mobile device to support one of the many development environments like J2ME . J2ME is fast becoming an industry standard to deploy mobile applications and requires the mobile phone to support Java. The major disadvantage of mobile application clients is that the applications needs to be customized to each mobile phone on which it might finally run. J2ME ties together the API for mobile phones which have the similar functionality in what it calls 'profiles'. Out of J2ME and BREW, J2ME seems to have an edge right now as Nokia has made the development tools open to developers which has further fostered a huge online community focused in developing applications based on J2ME. Nokia has gone an additional mile by providing an open online market place for developers where they can sell their applications to major cellular operators around the world.Quite a few mobile software product companies have rolled out solutions, which enable J2ME mobile applications, based banking. One such product is Wireless Ibanco.The mobile user downloads and installs the wireless I-banco application on their J2ME pone. The J2ME client connects to the wireless I-banco server through the service providers GSM network to enable users to access information about their accounts and perform transactions. One of the other big advantages of using a mobile application client is that it can implement a very secure channel with end-to end encryption.

Positive impact of Mobile Banking

Cost Reduction

The biggest advantage of mobile banking offers to banks is that it drastically cuts down the costs of providing service to the customers. For service providers, Mobile banking offers the next surest way to achieve growth. Countries like India where mobile penetration is nearing saturation, mobile banking is helping service providers increase revenues from the now static subscriber base. Service providers are increasingly using the

complexity of their supported mobile banking services to attract new customers and retain old ones.

To Control Fraud

A very effective way of improving customer service could be to inform customers better. Credit card fraud is one such area. A bank could, through the use of mobile technology, inform owners each time purchases above a certain value have been made on their card. This way the owner is always informed when their card is used, and how much money was taken for each transaction.

Reminder Facility

Similarly, the bank could remind customers of outstanding loan repayment dates, dates for the payment of monthly installments or simply tell them that a bill has been presented and is up for payment. The customers can then check their balance on the phone and authorize the required amounts for payment The customers can also request for additional information. They can automatically view deposits and withdrawals as they occur and also pre- schedule payments to be made or cheques to be issued. Similarly, one could also request for services like stop cheque or issue of a cheque book over one's mobile phone.

Easy to avail Mobile Services

A mobile is almost always with the customer. As such it can be used over a vast geographical area. The customer does not have to visit the bank ATM or a branch to avail of the bank's services. Research indicates that the number of footfalls at a bank's branch has fallen down drastically after the installation of ATMs. As such with mobile services, a bank will need to hire even less employees as people will no longer need to visit bank branches apart from certain occasions. With Indian telecom operators working on offering services like money transaction over a mobile, it may soon be possible for a bank to offer phone based credit systems. This will make credit cards redundant and also aid in checking credit card fraud apart from offering enhanced customer convenience. The use of mobile technologies is thus a win-win proposition for both the banks and the bank's customers.

The banks add to this personalized communication through the process of automation. For instance, if the customer asks for his account or card balance after conducting a transaction, the installed software can send him an automated reply informing of the same. These automated replies thus save the bank the need to hire additional employees for servicing customer needs

Security features

Customer will receive the alerts only in the mobile number, which he has registered with bank. Moreover the sensitive information such as account number is not sent as a whole. But only the last six digits and account type will be sent to the customer. The customer can receive his account balance and transactions only when the request is received from the mobile phone number registered with us and duly authenticated by the 4 digit Code Number, which will be provided when PULL Alert services are introduced. The mobile phone number and the Code number from which the service is accessed will serve as a User ID and password for authentication. The Code number has therefore to be kept confidential

Negative impact of Mobile Banking

Security

Security experts generally agree that mobile banking is safer than computer banking because very few viruses and Trojans exist for phones. That does not mean mobile banking is immune to security threats, however Mobile users are especially susceptible to a phishing-like scam called "smishing." It happens when a mobile banking user receives a fake text message asking for bank account details from a hacker posing as a financial institution. Many people have fallen for this trick and had money stolen through this scam.

Online banking is usually done through an encrypted connection so that hackers cannot read transmitted data, but consider the consequences if your mobile device is stolen. While all banking applications require you to enter a password or PIN, many people configure their mobile devices to save passwords, or use insecure passwords and PINs that are easy to guess.

Compatibility

Mobile banking is not available on every device. Some banks do not provide mobile banking at all. Others require you to use a custom mobile banking application only available on the most popular smart phones, such as the Apple iPhone and RIM Blackberry. Third-party mobile banking software is not always supported.

If you do not own a smart phone, the types of mobile banking you can do are usually limited. Checking bank account balances via text message is not a problem, but more advanced features such as account transfers are generally not available to users of "dumb phones."

Cost

Network service charges quickly add up. The cost of mobile banking might not appear significant if you already have a compatible device, but you still need to pay data and text messaging fees. Some financial institutions charge an extra fee for mobile banking service, and you may need to pay a fee for software. These extra charges quickly add up, especially if you access mobile banking often.

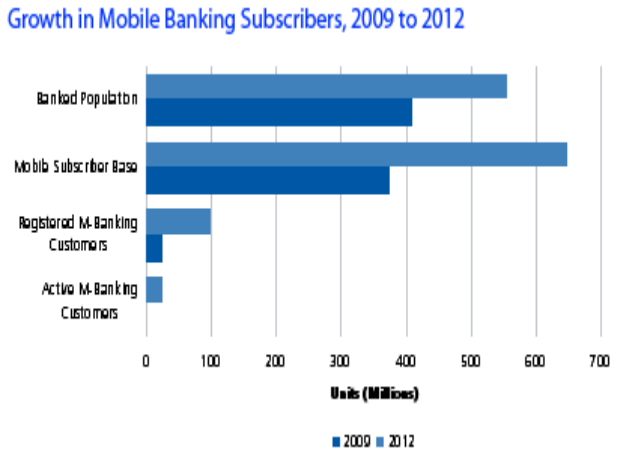
Mobile Banking Growth 2009 to 2012

Mobile banking in India is in a budding stage, with the high penetration of mobile phones acting as a growth driver. India's existing mobile phone user base consists of 347 million users, including 73 million rural users. The Growth of mobile banking active users base to reach 2% by 2012, up from the current 0.2%.

In a new report, examines the potential for mobile banking growth in India's urban and rural markets. Mobile banking is currently free of cost to encourage customers to adopt this new channel. Despite this, the registered user base is only 25 million people, and the active user base is just 10% or 2.5 million of registered user base.

One major reason for the current low adoption of mobile banking, especially among the urban population, is the availability of alternative modes of banking, such as accessibility

to ATMs, online banking, etc. Mobile payments have evidenced better usage among youth. The young, banked, urban working populations are tech-savvy and present short-term potential for the growth of mobile banking in India.



III. Conclusion

The aim of my paper is to review of research paper on mobile banking to analyze the different factors as Negative and Positive that impact adoption of mobile banking, and to introduce the mobile banking emerging technologies and services.

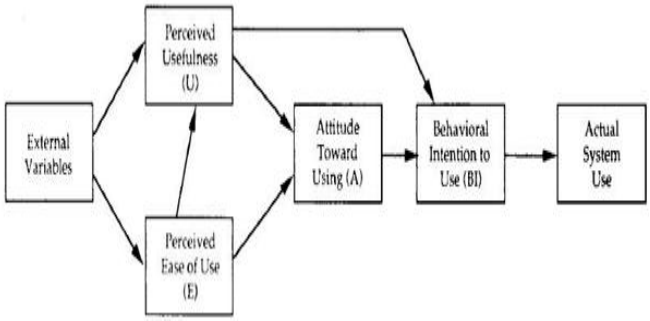
It is well recognized that mobile phones have immense potential of conducting financial transactions thus leading the financial growth with lot of convenience and much reduced cost. and there are many positive factors are introduced such like Cost Reduction, To Control Fraud, Easy to avail Mobile Services and Reminder Facilities and have some Negative Factors are also introduced like Security ,Compatibility and Costly Network Service Charges.

For inclusive growth, the benefits of mobile banking should reach to the common man at the remotest locations in the country. For this all stakeholders like Regulators, Govt, telecom service providers and mobile device manufactures need to make efforts so that penetration of mobile banking reaches from high-end to low-end users and from metros to the middle towns and rural areas. Inclusion of non-banking population in financial main stream will benefit all. There is also need to generate awareness about the mobile banking so that more and more people use it for their benefit..

Adoption models: TAM, DIT,TBP

TAM is an adaptation of the Theory of Reasoned Action (TRA) to the field of IS. TAM posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use. Perceived usefulness is also seen as being directly impacted by perceived ease of use. Researchers have simplified TAM by removing the attitude construct found in TRA from the current specification (Venkatesh et. al., 2003). Attempts to extend TAM have generally taken one of three approaches: by introducing factors from related models, by introducing additional or alternative belief factors, and by examining antecedents and moderators of perceived usefulness and perceived ease of use (Wixom and Todd, 2005).

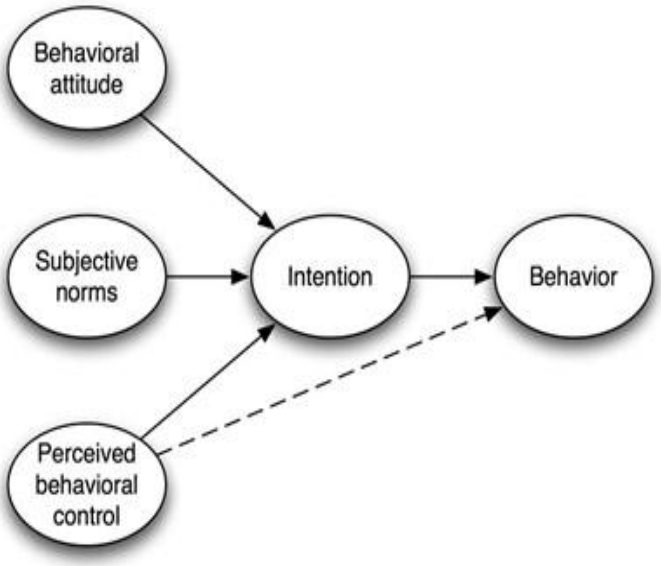
TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In practice constraints such as limited ability, time, environmental or organisational limits, and unconscious habits will limit the freedom to act



DIT "Diffusion of Innovations Theory"

Another well established theory for user adoption is IDT (Rogers, 1962, 1983, 1995).Innovation diffusion is achieved through users' acceptance and use of new ideas or things (Zaltman and Stiff, 1973). The theory explains, among many things, the process of the innovation decision process, the determinants of rate of adoption, and various categories of adopters, and it helps predict the likelihood and the rate of an innovation being adopted. Rogers, (1995) stated that an innovation's relative advantage,compatibility, complexity, trialability and observability were found to explain 49 to 87 per cent of the variance in the rate of its adoption. Other research projects including the meta-analysis of seventy-five diffusion articles conducted by Tornatzky and Klein, (1982)16 found that only relative advantage, compatibility and complexity were consistently related to the rate of innovation adoption

TBP(Theory of Behaviour Planning) Model



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