



## Journal of Internet Banking and Commerce

*An open access Internet journal (<http://www.arraydev.com/commerce/jibc/>)*

*Journal of Internet Banking and Commerce, December 2014, vol. 19, no.3  
(<http://www.arraydev.com/commerce/jibc/>)*

### **Customer Perception of Mobile Banking: An Empirical Study in National Capital Region Delhi**

---

**SHAMSHER SINGH, PhD**

**Associate Professor, Banarsidas Chandiwala Institute of Professional Studies, India**

*Postal Address: Plot no-9 ,Sector 11, Dwarka, New Delhi 110075, India*

*Author's Personal/Organizational Website: [www.bcips.ac.in](http://www.bcips.ac.in)*

*Email: [shamsher\\_1965@rediffmail.com](mailto:shamsher_1965@rediffmail.com)*

Dr Shamsheer Singh is Associate Professor and Head of Department – MBA Program in the Banarsidas Chandiwala Institute of Professional Studies, New Delhi. He received PhD in Management from Jamia Hamdard University, New Delhi (Joint Program of Jamia Hamdard University, New Delhi and MDI Gurgaon). His topic of research was 'The Study of Effectiveness of Customer Relationship Management in Indian Banking Sector with special reference to National Capital Region Delhi'. He completed his MBA degree with specialization in Marketing Management from Department of Management Science, University of Pune (PUMBA) in 1996, Post Graduate Diploma in Export-Import Management from Indian Merchant Chamber, Mumbai in 1998, Post Graduate Diploma in Human Resources Management from IGNOU, in 2002, and Post Graduate Degree in Public Administration from Panjab University, in 1992. He has wide experience of over 30 years in different fields including 14 years in teaching post graduate students .

---

#### **Abstract**

Internet technology is regarded as the third wave of revolution after agricultural and industrial revolution. After phone and net banking, technology is heralding the era of mobile banking in India. The growth of Mobile banking is phenomenal compared to previous deliver channels. It took approximately twenty years for ATMs to become popular while online banking took a decade. More so, with India all set to emerge as the second largest mobile subscriber base in the world after China, the telecom operators and banks are raring to use this medium to offer banking services including fund transfers to all sorts of people. Mobile banking can be categorized as the latest

advancement in electronic banking. This paper has examined the adoption and impact of mobile banking in on customer of different banks. The study surveys the opinion of 200 customers of banks located in Delhi. ANOVA and Factor Analysis have been used for having insights in the mobile banking services provided by the different banks. The population studied here is urban population which can be considered as representative of banking customers in Delhi.

**Keywords: Mobile banking; Electronic banking; Technology adoption; SMS Banking**

© Shamsher Singh, 2014

---

## **INTRODUCTION**

Recent innovations in telecommunications have enabled the launch of new access methods for banking services; one of these is mobile banking; whereby a customer interacts with a bank via mobile phone (Barnes & Corbitt, 2003). In India 617 million mobile subscribers far exceed fixed line subscribers because of better mobile infrastructure (TRAI, 2010). The banks in India are racing to use this latest technology to reduce their operational costs and increase customer base (Peterson, 2009). Mobile Banking refers to provision and availing of banking and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank transactions, to administer accounts and to access customized information (Tiwari & Buse, 2007). After the launch of mobile banking in India, mobile banking transactions have seen some growth. What attracts customers to mobile banking is the round the clock availability and ease of transactions. But mobile banking still has a long way to go as majority of customers prefer banking in the traditional ways (Ashta, 2010; Wang, Wang, Lin & Tang, 2003).

Mobile banking is a term used for performing balance checks, account transactions, payments etc. via a mobile device such as a mobile phone. Mobile banking today is most often performed via SMS or the mobile internet but can also use special programs called clients downloaded to the mobile device. It can also be understood as availing banking and financial services with the help of mobile telecommunications devices. The services offered by mobile banking included getting account information, transferring funds, sending checkbook request, managing deposits, checking transactions and so on. Mobile banking is most often performed by SMS and hence is also known as SMS banking. Commercial banks are exploring this avenue to make their services more convenient for their customers. The growing number of mobile subscribers in the country forms the most valuable support base for the growth and success of mobile banking.

Mobile banking services in India started with SMS banking way back in 2002. With an increasing mobile subscriber base in India, mobile banking has picked up steam in recent years. Today more than half the population in India has a mobile phone. However, less than 1% of that uses mobile phone as a medium for banking. Though mobile banking is synonymous with the word convenience banking, its usage is not anywhere close to its potential. With the advent of smart phones and ever growing usage of internet on mobile handsets, application based banking has emerged as a new

concept within this space. Other than SMS banking, banks are now offering banking services on mobile handsets through WAP-based internet websites and application based mobile banking services. (Mehta , 2012)

However, despite efforts made by Indian banks to expand the scope and usage of mobile channels, there are very few consumers who are actively using the same. Some of the reasons contributing to this include the lack of adoption of mobile as a channel for banking despite the push, limitations of services on mobile banking, non-replication of mobile banking services in varied languages in India, etc. Now, banks have started offering mobile banking services through another innovative method called USSD (Unstructured Supplementary Service Data). This platform works on menu-based banking model on mobile handsets where users can perform mobile banking services by recalling the menu and simply dialing a number. Greater acceptability and usage of users are yet to reach a critical mass.

With the RBI relaxing the limit on the value of mobile-based transactions from Rs. 50,000 per day to any limit and allowing non-banks to offer banking services as business correspondents appointed by banks, the focus is to drive banking services in rural areas where a large population is still devoid of banking facilities. This will also allow banks and non-banks to offer payment solutions using a mobile phone with the development of near field communication, barcode and sound wave technologies. This will help us reach the goal of financial inclusion in India. With these technologies in place, banking on mobile handsets should lead to more transactions on the move as increased reach and last mile connectivity is better achieved via mobiles compared to traditional banking channels like branches and ATMs.

## **REVIEW OF THE LITERATURE**

Clark (2008) suggested that as a channel the mobile phone can augment the number of channels available to consumers, thereby giving consumers more low-cost self-service options by which to access funds, banking information and make payments. Mobile as a channel delivers convenience, immediacy and choice to consumers. But there are a large number of different mobile phone devices and it is a big challenge for banks to offer Mobile banking solution on any type of device. Some of these devices support Java2Micro Edition (J2ME) and others support Wireless Application Protocol (WAP) browser or only SMS. Barnes and Corbitt (2003); Scornavacca and Barnes (2004) suggest that recent innovations in telecommunications have enabled the launch of new access methods for banking services, one of these is mobile banking; whereby a customer interacts with a bank via a mobile device such as a mobile phone or personal digital assistant. Further Vyas (2009) stated that Indian banks will target non online banking users who may lack regular access to desktop internet but are very likely to own a mobile device, thus reporting great potential of Mobile banking in India.

The report of Vital Analytics suggested huge potential of Mobile banking in India, as it found that urban Indian customers' checking account balance is the most frequently cited reason for using Mobile banking. 40 million Urban Indians used their mobile phones to check their bank account balances followed by viewing last three transactions. Karjaluo (2002); Rugimbana (1995) found that there is vast market potential for mobile banking due to its always-on functionality and the option to do banking virtually any time and anywhere. Unnithan and Swatman (2001) studied the drivers for change in the

evolution of the banking sector, and the move towards electronic banking including mobile banking by focusing on two economies, Australia & India and suggested strong growth potential of new banking channel in India.

Vyas (2009); Rao et al. (2003) suggest banks will need to expand their thinking about mobile banking beyond online banking and should start to view mobility as its own powerful and compelling delivery channel that can help them deliver to end users new value such as immediate access and additional control of personal finances. Gupta (2013); Dasgupta et al (2011) also affirms future of mobile banking in India in their studies. Suoranta (2003) found that the average mobile banking user is married, 25 to 34 years old, has intermediate education and average income in clerical work. She found that age and education have a major influence on the use of the mobile phone in banking services. The adoption theories assume that use of Internet banking precedes the adoption of the mobile phone in banking. However, Suoranta (2003) found that some mobile banking customers omit Internet banking adoption when adopting the mobile phone for banking actions. Polatoglu and Ekin (2001); Al-Ashban and Burney (2001); Karjaluo (2002); Black et al. (2002) supports findings of Suoranat in their respective studies.

Mas (2008); Lyman et al. (2008) found that there are a large number of different mobile phone devices and it is a big challenge for banks to offer mobile banking solution on any type of device. Some of these devices support J2ME and others support WAP browser or only SMS; presetting a serious challenge. Hayat (2009) suggests that for a banking regulator it is important to provide adequate protection for consumers, ensure economic stability, provide interoperability of electronic systems and guarantee security of transactions and Anti Money Laundering and Know-Your-Customer principles must also be applied to mobile payments. Comminos et al. (2008) suggest that unbanked will only transact electronically (online/mobile banking) if there is convenience and security. Sharma and Singh (2009) found that Indian mobile banking users are specially concern with security issues like financial frauds, account misuse and user friendliness issue - difficulty in remembering the different codes for different types of transaction, application of software installation & updating due to lack of standardization. Banzal (2010) found that another major issue is the revenue sharing agreements between mobile service providers, banks, content providers, aggregators and other service providers like utilities, travel agencies, hotel industry, retailers etc

Mobile banking is an application of m-commerce which enables customers to access bank accounts through mobile devices to conduct and complete bank-related transactions such as balancing cheques, checking account statuses, transferring money and selling stocks (Kim et al., 2009; Tiwari & Buse, 2007, p.64). Luo, et al (2010), defined mobile banking as an innovative method for accessing banking services via a channel whereby the customer interacts with a bank using a mobile device (e.g. mobile phone or personal digital assistant (PDA)). There are challenges associated with m-commerce, and specifically mobile banking. Mobile devices with a small screen size, limited screen resolution and uncooperative keypad may make it difficult for the customer to use mobile banking (Kim et al., 2009). Mobile banking is also vulnerable to information and transaction eavesdropping risk, just like other e-commerce applications such as Internet banking (Siau and Shen, 2003).

Unmet needs lead to new inventions and innovations and these create new economic relationship. New invention and new fusions take place with apparently dissimilar partners creating a need for other institutional adoptions. Such a fusion is now occurring between the banking industry and the telecommunication industry, creating a concept called Mobile Banking Astha (2010) have described that mobile banking is a new invention for unmet demand of the customers especially for the poor. They have emphasized for mobile banking regulation to avoid some risks banks and telecommunications face such as liquidity risk, credit risk, privacy risk, inoperability risk etc. They think regulation will help reduce the risk level and the institutions reach the top of the industry, but regulation should not minimize the benefits of mobile banking.

Mobile banking is a part of new banking dimension i.e. branchless banking to make any bank digital. This branchless banking has great potential to extend the distribution of financial services to poor people who are not reached by traditional bank branch network; it lowers the cost of delivery, including cost of both to the banks of building and maintaining a delivery channel and to customers of accessing services (Ivatury and Mas, 2008). The development of information technology has a enormous effect on development of more flexible payments methods and more-user friendly banking services (Dixit and Datta, 2010). Mobile Banking is one of the very latest services of banking business. This system has brought some very important operations of banking in the pockets of people. People can now know their balance, transaction history, products of the bank, transfer fund through their mobile at anytime from anywhere.

The people who are outside of the banking world is large. To capture and serve them mobile banking will work a lot. It has become a fusion to create financial security and more efficient infrastructure that reduces corruption and ensures economic development (Camner and Sjoblon, 2009). Anaysi and Otubu (2009) have shown the economic effect of mobile banking and found out that it is offering different services to its customers. It helps to manage money without handling cash. They have also got the great scope of extending mobile banking business to contribute to the economic development. Scornavacca and Hoehle (2006) in their work "Mobile Banking in Germany" have portrayed the picture of mobile banking offered in Germany especially the services offered by Post bank, Hamburg's Savings bank, and the DZ bank. There are some factors which make the adoption of mobile banking service easy for the customers and those are convenience, cost, security, confidentiality, handset operability, procedure and knowledge and network.

### **Importance of Mobile Banking**

Mobile banking has lot of advantages for both providers and those who avail the services. It has really become multi beneficial. Banks do not require much investment and they do not even have to modify their existing infrastructure. Banks can send the message in fewer efforts to a huge number of people. Mobile banking also helps Banks to form good relations with their customers. In mobile banking, Banks get valuable data about the customers which help them in effective customer's relationship management practices. It facilities quick feedback and helps in customer retentions and customer loyalty. Mobile phones provide a way to reach out to people in isolated areas. When banks have customer database, they can use SMS advertising to give information about their service to their existing customers. This helps in the communication and promotion of new customers. Customers enjoy anytime anywhere banking with the help of their

mobile phones. They need not stand in the queues or face the employees whom do not. Mobile banking is cost-effective for bankers and customers. The information can also be stored automatically in mobile as a proof in the form of SMS as proof, whether sent or received.

### **Trends in Mobile banking**

Recent research by ACI Worldwide, conducted in March 2012 across 14 countries, shows clearly the growing importance of mobile payments and banking. Eighty percent of respondents in India have used their mobile phone for banking, 79 percent of in China and two-thirds of respondents in the UAE. This compares to an average of 33 percent in North America and Europe. Again, Canadians are the least likely to use a mobile phone for banking: only 15 percent have done so in the past six months and only 22 percent would do so. Italians are the most enthusiastic users of mobile banking in Europe: 50 percent have done so in the past six months and 63 percent would in the next six. However, this still falls short of the 91 percent in India, 90 percent in China and 80 percent in the UAE who would use mobile banking services.

These numbers reflect the personal sentiments of those surveyed. More than 75 percent of respondents in Brazil, Singapore, South Africa, the UAE, China and India said that the ability to move money and make payments using a mobile phone would be very or somewhat important to them, compared to 50 percent or fewer in the U.K., Germany, Sweden, France and Canada. Italians were once more the most enthusiastic proponents of mobile payments in Europe, with 74 percent saying it would be important to them.

According to Reserve bank of India (RBI) data, a total of 3.7 crore mobile transactions took place between February and November 2012, jumping around 1.7 times in volumes over this 10-month period. These transactions saw nearly a three-fold increase in value over the same period. Increasing smart phone adoption and initiatives such as media promotions and customer education programmes for mobile banking have led to this uptrend. For customers, mobile banking is convenient while banks benefit through a low-cost channel.

The SBI group dominates this space in volume terms with an overall share of 67.4 per cent in total volumes. Private and foreign banks follow, with an overall share of 30.1 per cent in November 2012 (Kiran 2013).

**Table 1 : Mobile Banking transaction in India**

Month	Volume ( actual )	Value ( in Rs '000'
February, 2012	2,799,554	1,960,417
March , 2012	3,123,105	2,325,321
April , 2012	3,178,405	2,345,678
May , 2012	3,346,743,	2,865,454
June , 2012	3,437,074	3,067,107
July , 2012	3,705,690	3,379,715
August , 2012	3,968,226	3,548,628
September, 2012	3,897,614	4,104,519
October , 2012	4,437,342	7,790,473
November , 2012	4,720,871	5,389,548

(Source RBI <http://business today.intoday.in/story/mobile-banking-on-the-rise-in-india/1/191851.html>)

Among banks, SBI leads the race with 65.4 per cent share in the total number of mobile transactions carried out in November, followed by ICICI Bank with a 14.2 per cent share, Axis with 9.4 per cent and Citi bank with 3.5 per cent. Around three per cent of SBI's total customer base is into mobile banking transactions. For ICICI Bank, over 10 million customers have currently registered for mobile banking. Prepaid mobile recharges, DTH recharges, ticket bookings (movies/travel) are among the fast growing transactions in mobile banking.

At present more than 65 banks have been approved for conduct of mobile banking out of which 47 banks have commenced offering these services. Transactions in mobile banking have been showing an uptrend. During February 2012, more than 2.8 million transactions for close to Rs. 1961.23 million were transacted; a 300 % increase in volume and more than 200% in value terms as compared to 0.7million transactions for close to Rs 616.19 million during February 2011. Indian banks are taking efforts to expand the usage and scope of mobile banking. In spite of these efforts very few customers are actively using Mobile Banking. The reasons are lack of adoption of mobile as a means for banking, limitations of services on Mobile Banking, non-replication of Mobile Banking services in different languages in India etc. Nowadays Banks in India are using new innovative method for Mobile Banking called USSD (Unstructured Supplementary Service Data). This is menu-based banking model on mobile handsets where customer can perform Mobile Banking services by recalling the menu and simply dialing a number.

The Reserve Bank of India (RBI) has already issued notification regarding mobile banking transactions in India. In order to ensure faster and reliable communication for enabling banking through mobile phones, the Telecom Regulatory Authority of India (TRAI) issued the new regulations for mobile banking. "The Mobile Banking Regulations, 2012" . The access service providers shall facilitate the banks to use SMS, USSD and IVR (Interactive Voice Response) to provide banking services to its customer. According to the regulations, the response time for delivery of message for mobile banking services generated by the customer or the bank will be within the time frame of less than or equal to 10 seconds for SMS and IVR and less than or equal to 2 seconds USSD. The regulator has also mandated if SMS sent by the bank is not delivered to the customer due to network or handset related problems, an USSD communication confirming the completion of the transaction should be sent to the customer.

The service providers are also asked to ensure that for availing banking services such as cash deposit, cash withdrawal, money transfer and balance enquiry, the customer is able to complete the transaction in not more than two stage transmission of message in the case of SMS or not more than two stage entry of options in the case of USSD and IVR. They will also be required to maintain complete and accurate record of the transactions.

As the number of mobile users in India is increasing day by day, there is a great scope for mobile banking. Therefore the customer should be made aware of Mobile Banking.

## OBJECTIVES AND HYPOTHESES

The present study aims to explore the customer perception on the different dimensions of mobile banking based on respondents' perception on various mobile banking applications. The Study also has examined the following about mobile banking :

- To find the factors associated with customer's perception towards the adoption of mobile banking.
- To identify different services available to customers through mobile banking.
- To identify the growth and scope of mobile banking.
- To find significant factor of mobile banking.

### Hypotheses

In pursuance of the above objectives, the following hypotheses were formulated for testing:

**H<sub>01</sub>:** There is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' gender.

**H<sub>02</sub>:** There is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' age group..

**H<sub>03</sub>:** There is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' education level

**H<sub>04</sub>:** There is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' income level

**H<sub>05</sub>:** There is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' occupation.

## RESEARCH METHODOLOGY

The study employs primary data as well as secondary data. Secondary data was collected from different published sources. Primary data was collected by structured survey. The survey was created online as well as off line.

### Population of Study

Study population comprised the residents of National Capital Region Delhi using mobile banking services . Individuals who have been using mobile banking services since last six months were targeted for the study.

### The Sample

**Sampling Unit:** In this study, the sampling unit was the customers of different banks who had an account in any branch located in National Capital Region Delhi and have been using mobile banking facility. Convenience sampling method was adopted to select the customers. There was no discrimination on the bases of occupation, age, or educational level.

### Sample Size

he sample size was 200. This is fairly large to represent the population. The well structured questionnaire was used collect primary data .



### **Development of Research Instrument**

**Step-1** :In order to develop a questionnaire, in depth literature review on mobile banking was carried out

**Step-2:** Based on the information gathered and literature review, the following characteristics were short listed for further study:

- Mobile banking is easy to use
- Mobile banking services are safe to use
- Balance Enquiry is adequate and reliable
- Bill payment services offered by bank through mobile banking is easy and quick
- Money transfer facility is reliable
- Time taken to learn mobile services is more
- Transaction may not be completed due to network problem
- Worried about the Safety of personal information
- Worried about security of mobile banking transaction
- Fear of disconnection during transaction
- Fear of running out of battery during transaction
- Mobile banking should be affordable
- Mobile banking enables me to utilize banking service more quickly and enhance effectiveness
- In my opinion mobile banking is useful to me
- Instruction for using mobile banking are easy to follow
- When transaction error occurs I worry that I cannot get compensation from bank
- I am over all satisfied with the Mobile banking of my bank

**Step-3** : Prior to the final survey, the questionnaire was pre tested using a sample of respondents similar in nature to the final sample. The goal of pilot survey was to ensure readability and logical arrangements of questions. The questionnaire was administered to 50 customers of included in the study to ensure that the respondents understand the questions.

**Step-4:** The responses of pilot study were thoroughly analyzed. The questionnaire was reviewed in light of comments and shortcomings and then it was revised accordingly. The final questionnaire was administered to 200 respondents as per the sampling plan.

### **Research and Statistical Tools Employed**

The research and statistical tools employed in this study are factor analysis, and ANOVA (Analysis of Variance). SPSS 16 was used to perform statistical analysis. The reliability of the data was carried out by using Cronbach's Alpha Value. ANOVA was employed to find the significant factor which will determine the overall customer satisfaction. Factor analysis to examine the underlying or latent mobile banking dimensions within variables of overall satisfaction (Hair et al, 2006). Both Bartlett's test of sphericity and measure of sampling adequacy (MSA) were also carried out to ensure that the requirements of factor analysis were met.

## RESULTS

We examined the various practices/ techniques adopted by the banks and response of the customers were analyzed using the SPSS 10.0 software program. The analysis of this data was divided into following section:

- (i) Respondent Profile : Table 2
- (ii) Reliability Analysis : Table 3
- (iii) KMO and Bartlett's Test : Table 4
- (iv) Total variance Explained : Tables 5
- (v) Exploratory Factor Analysis - Rotated Component Matrix : Table-6
- (vi) ANOVA :(Table 7- 11)

**Table 2 : Demographic Profile of Respondents**

Variable	Characteristics	Frequency	Percentage
Gender	Male	146	73
	Female	54	27
Education	Post Graduation& Above	71	35.5
	Graduation	109	54.5
	10+2	20	10
Age group	18-30 yrs	54	27
	31-45 yrs	111	55.5
	46yrs and above	35	17.5
Occupation	Government service	73	36.5
	Private service	81	40.5
	Business	24	12
	Student	22	11
Income	Rs.50,000-,200,000 pa	24	12
	Rs.2,00,001-5,00,000 pa	98	49
	Rs.5,00,001-,8,00,000 pa	47	23.5
	Rs 8,00,001 and above pa	31	15.5

The respondent profile as displayed in table 2 indicates the current scenario of banking sector and their user's profile. Most of the respondents (40.5%) were employed in private sector followed by government service and business at 36.5% and 12. Significant the number of students ( 11%) are also using mobile banking is and they are future prospect for the banks when they will enter into any profession. It is clear that National Capital Region being the leading area in educational facilities, the majority of the respondents were either graduate (54.5%) or post graduate (35.5%). This clearly indicate the education plays an important and significant role in adoption of the mobile banking. On the basis of income maximum respondents fall in the 2-5 lacks category (49%) followed by 5-8 lacks category (23.5%) . If we look at the age group , the majority of respondents falls in the age group of 31-45 years (55% ) followed by the 18-30 years (27%) . If we combine these two age group, 82% respondents will fall under this category .

The profile of respondents indicates they are young, educated and decently employed, which is also the new generation who are tech savvy and wants the services at the click

of the button or mouse. This generation has adopted the technology application as their way of life , which represent a significant opportunities to the banking sector to enhance their services by use of mobile , internet or other technological application.

**Reliability and Validity**

Table 3 shows the result of reliability analysis- Cronbach's Alpha Value. This test measured the consistency between the survey scales. The Cronbach's Alpha score of 1.0 indicate 100 percent reliability. Cronbach's Alpha scores were all greater than the Nunnally's (1978) generally accepted score of 0.7. In this case, the score was 0.869 for the Internet banking service provided by the banks.

**Table 3 : Reliability Analysis-Scale (ALPHA)**

Services	Number of Cases	Number of Items	Alpha Value
Mobile banking	200	18	0.869

In order to carry to carry out the factor analysis, it is necessary to find the suitability of data. Suitability of data is examined with the help of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMSA) and Bartlett's Test of Sphericity (Hair et al, 2006). Result of test are given in the table-4. The results support the suitability of sample for factor analysis.

**Table 4 : KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMSA)		.835
Bartlett's Test of Sphericity	Approx. Chi-Square	1824.249
	df	153
	Sig.	.000

**Factor Analysis**

Overall, the set of data meets the fundamental requirements of factor analysis satisfactorily (Hair et al, 2006). In analyzing the data given, the 18 response items were subjected to a factor analysis using the principal component method As in common practice, a Varimax rotation with Kaiser Normalization was performed to achieve a simpler and theoretically more meaningful factor solution. The Cronbach's alphas score for all the factors were above the cutoff point (0.7) recommended by Nunnally (1978) .

Using the criteria of an Eigen value greater than one, four clear factors emerged accounting for 79.31% of the total variance.

These four factors are labeled as Safety/Security, Reliability, Efficiency and Responsiveness.

**Table 5 : Total Variance Explained**

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.423	52.352	52.352	9.423	52.352	52.352	5.390	29.945	29.945
2	2.049	11.384	63.736	2.049	11.384	63.736	3.436	19.090	49.035
3	1.610	8.943	72.680	1.610	8.943	72.680	2.944	16.355	65.391
4	1.194	6.635	79.315	1.194	6.635	79.315	2.506	13.924	79.315
5	.790	4.389	83.705						
6	.533	2.963	86.668						
7	.478	2.656	89.324						
8	.356	1.978	91.302						
9	.329	1.830	93.132						
10	.260	1.447	94.579						
11	.224	1.244	95.823						
12	.198	1.098	96.922						
13	.149	.825	97.747						
14	.127	.708	98.455						
15	.104	.580	99.035						
16	.095	.527	99.562						
17	.054	.301	99.863						
18	.025	.137	100.000						

**Table 6 : Exploratory Factor Analysis - Rotated Component Matrix**

Statements	Component			
	Reliability factor	Safety/ Security factor	Efficiency factor	Responsiveness factor
Mobile banking is easy to use	.124	-.021	<b>.857</b>	-.055
Mobile banking services are safe to use	-.119	.326	<b>.809</b>	.272

Balance Enquiry is adequate and reliable	<b>.562</b>	.314	.539	.236
Bill payment services offered by bank through mobile banking is easy and quick	<b>.562</b>	.451	.377	-.072
Money transfer facility is reliable	<b>.812</b>	.208	.027	.049
Time taken to learn mobile services is more	-.680	<b>.455</b>	-.087	-.241
Transaction may not be completed due to network problem	-.199	<b>.466</b>	.214	-.710
Worried about the Safety of personal information	-.788	<b>.258</b>	-.286	-.016
Worried about security of mobile banking transaction	-.317	<b>.497</b>	-.639	.055
Fear of disconnection during transaction	<b>-.686</b>	-.218	-.419	-.332
Fear of running out of battery during transaction	<b>-.534</b>	-.019	-.461	-.395
Mobile banking should be affordable	.538	.315	.060	<b>.614</b>
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	.107	.073	.236	<b>.900</b>
In my opinion mobile banking is useful to me	<b>.741</b>	.360	.067	.379
Instruction for using mobile banking are easy to follow	.547	<b>.743</b>	.133	.193
When transaction error occurs I worry that I cannot get compensation from bank	.143	<b>.881</b>	.196	.213
I am over all satisfied with the Mobile banking of my bank	-.877	-.050	.055	-.171

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

It is clear from the factor loadings as highlighted in Table 6, that four factors emerged. These four factors represent different elements of Mobile Banking services that form the underlying factors from the original 18 scale response items given. Referring to the Table 6 above, first factor represents elements of the service quality directly related to reliability of informations related to balance enquiry, bill payment money transfer and usefulness of informations hence names as “**Reliability factor**” . The second factor is related to reliability of service dimension and hence names as “**Safety/Security factor**”. It includes the dimensions such as keeping safety of personal information ,security of transactions , transaction errors and instructions for use . The third factor is related to efficiency and use of service and hence named as “**Efficiency factor**”. Fourth factor is directly related to responsiveness of the service quality , it is therefore labeled as “**Responsiveness factor**” . These elements are affordability to use, quick utilisation of services and enhancing effectiveness

**Table 7 : Computation of ANOVA for Gender**

Statements	Sum of Squares	df	Mean Square	F	Sig.
Mobile banking is easy to use	1.174	1	1.174	2.410	.124
Mobile banking services are safe	10.346	1	10.346	11.971	<b>.001</b>
Balance Enquiry is adequate and reliable	4.165	1	4.165	2.504	.117
Bill payment services offered by bank through mobile banking is easy and quick	1.018	1	1.018	.897	.346
Money transfer facility is reliable	.587	1	.587	.412	.522
Time taken to learn mobile services is more	.073	1	.073	.075	.785
Transaction may not be completed due to network problem	.127	1	.127	.105	.747
Worried about the Safety of personal information	.026	1	.026	.017	.896
Worried about security of mobile banking transaction	1.014	1	1.014	.897	.346
Fear of disconnection during transaction	.283	1	.283	.188	.666
Fear of running out of battery during transaction	.003	1	.003	.004	.952
Mobile banking should be affordable	.776	1	.776	.722	.398
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	5.918	1	5.918	3.578	.061
In my opinion mobile banking is useful to me	.101	1	.101	.050	.824
Instruction for using mobile banking are easy to follow	1.736	1	1.736	.830	.365
When transaction error occurs I worry that I cannot get compensation from bank	1.388	1	1.388	.909	.343
I am over all satisfied with the Mobile banking of my bank	2.659	1	2.659	1.003	.319

Table 7 exhibits the ANOVA results of Mobile banking perception for gender of the respondents . The result suggests that there are no significant differences in the perceptions for any dimensions of Mobile banking except **“Mobile banking services are safe ”** hence we accept  $H_{01}$ : and conclude that here is no significant difference in the customer perception of mobile banking dimensions based on respondents' gender

**Table 8 : Computation of ANOVA for Age Group**

Statements	Sum of Squares	df	Mean Square	F	Sig.
Mobile banking is easy to use	.890	2	.445	.899	.410
Mobile banking services are safe	.675	2	.337	.347	.708

Balance Enquiry is adequate and reliable	8.936	2	4.468	2.739	.070
Bill payment services offered by bank through mobile banking is easy and quick	.986	2	.493	.430	.652
Money transfer facility is reliable	8.470	2	4.235	3.123	<b>.048</b>
Time taken to learn mobile services is more	.240	2	.120	.121	.886
Transaction may not be completed due to network problem	1.885	2	.943	.782	.460
Worried about the Safety of personal information	2.514	2	1.257	.821	.443
Worried about security of mobile banking transaction	.309	2	.154	.134	.874
Fear of disconnection during transaction	1.109	2	.554	.367	.694
Fear of running out of battery during transaction	8.640	2	4.320	5.365	<b>.006</b>
Mobile banking should be affordable	1.016	2	.508	.469	.627
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	6.418	2	3.209	1.927	.151
In my opinion mobile banking is useful to me	.052	2	.026	.013	.987
Instruction for using mobile banking are easy to follow	.031	2	.016	.007	.993
When transaction error occurs I worry that I cannot get compensation from bank	.066	2	.033	.021	.979
I am over all satisfied with the Mobile banking of my bank	4.026	2	2.013	.755	.473

Table 8 exhibits the ANOVA results of mobile banking perception for various age groups. The result suggests that there are significant differences in the perceptions of respondents for **“Money transfer facility is reliable and fear of running out of battery during transaction”** all other dimensions of mobile banking service quality across the age group do not show any significant different in their perception . Since there is no significant difference in all dimensions except two we accept the  $H_{02}$ : and conclude that there is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents’ age group.

**Table 9 : Computation of ANOVA for Education**

Statements	Sum of Squares	df	Mean Square	F	Sig.
Mobile banking is easy to use	5.528	3	1.843	4.078	<b>.009</b>
Mobile banking services are safe	1.172	3	.391	.400	.754
Balance Enquiry is adequate and reliable	4.685	3	1.562	.923	.433
Bill payment services offered by bank through mobile banking is easy and quick	2.536	3	.845	.740	.531
Money transfer facility is reliable	3.421	3	1.140	.802	.496

Time taken to learn mobile services is more	.789	3	.263	.265	.850
Transaction may not be completed due to network problem	2.433	3	.811	.669	.573
Worried about the Safety of personal information	7.944	3	2.648	1.776	.157
Worried about security of mobile banking transaction	3.572	3	1.191	1.056	.371
Fear of disconnection during transaction	1.389	3	.463	.304	.823
Fear of running out of battery during transaction	4.025	3	1.342	1.557	.205
Mobile banking should be affordable	2.389	3	.796	.737	.533
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	.582	3	.194	.111	.953
In my opinion mobile banking is useful to me	3.321	3	1.107	.546	.652
Instruction for using mobile banking are easy to follow	3.225	3	1.075	.507	.678
When transaction error occurs I worry that I cannot get compensation from bank	.772	3	.257	.164	.920
I am over all satisfied with the Mobile banking of my bank	5.085	3	1.695	.632	.596

Table 9 exhibits the ANOVA results of Mobile banking perception for education level of respondents . The result suggests that there are no significant differences in the perceptions for any dimensions of mobile banking except “**Mobile banking is easy to use**” hence we accept  $H_{03}$ : and conclude that here is no significant difference in the customer perception of mobile banking dimensions based on respondents’ education level . This preposition is further supported by the demographic profile which indicate that the majority of the respondents were either graduate (54.5%) or post graduate (35.5%).

**Table 10 : Computation of ANOVA for Income**

Statements	Sum of Squares	df	Mean Square	F	Sig.
Mobile banking is easy to use	2.249	2	1.125	2.338	.102
Mobile banking services are safe	6.629	2	3.315	3.637	<b>.030</b>
Balance Enquiry is adequate and reliable	3.249	2	1.625	.961	.386
Bill payment services offered by bank through mobile banking is easy and quick	5.263	2	2.631	2.386	.097
Money transfer facility is reliable	3.049	2	1.525	1.080	.344
Time taken to learn mobile services is more	.538	2	.269	.273	.761
Transaction may not be completed due to network problem	.787	2	.393	.323	.725



Worried about the Safety of personal information	1.540	2	.770	.500	.608
Worried about security of mobile banking transaction	2.640	2	1.320	1.173	.314
Fear of disconnection during transaction	2.173	2	1.086	.724	.487
Fear of running out of battery during transaction	2.225	2	1.113	1.277	.284
Mobile banking should be affordable	.404	2	.202	.185	.831
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	3.049	2	1.525	.897	.411
In my opinion mobile banking is useful to me	.610	2	.305	.150	.861
Instruction for using mobile banking are easy to follow	6.322	2	3.161	1.530	.222
When transaction error occurs I worry that I cannot get compensation from bank	6.950	2	3.475	2.340	.102
I am over all satisfied with the Mobile banking of my bank	.797	2	.398	.148	.863

Table 10 exhibits the ANOVA results of Mobile banking perception for income of respondents. The result suggests that there are no significant differences in the perceptions for any dimensions of mobile banking service quality except **“Mobile banking services are safe ”** hence we accept  $H_{04}$ : and conclude that here is no significant difference in the customer perception of mobile banking dimensions based on respondents’ income . This preposition is further supported by the demographic profile which indicate that the majority of the respondents were either graduate (54.5%) or post graduate (35.5%).

**Table 11 : Computation of ANOVA for Occupation**

Statements	Sum of Squares	df	Mean Square	F	Sig.
Mobile banking is easy to use	1.945	5	.389	.779	.568
Mobile banking services are safe	1.678	5	.336	.338	.889
Balance Enquiry is adequate and reliable	5.004	5	1.001	.580	.715
Bill payment services offered by bank through mobile banking is easy and quick	6.354	5	1.271	1.128	.351
Money transfer facility is reliable	11.226	5	2.245	1.639	.157
Time taken to learn mobile services is more	1.949	5	.390	.390	.855
Transaction may not be completed due to network problem	5.999	5	1.200	1.000	.422
Worried about the Safety of personal information	2.606	5	.521	.330	.894
Worried about security of mobile banking transaction	7.296	5	1.459	1.313	.265

Fear of disconnection during transaction	8.986	5	1.797	1.217	.307
Fear of running out of battery during transaction	6.187	5	1.237	1.444	.216
Mobile banking should be affordable	3.652	5	.730	.670	.647
Mobile banking enables me to utilize banking service more quickly and enhance effectiveness	8.454	5	1.691	.996	.424
In my opinion mobile banking is useful to me	5.134	5	1.027	.500	.775
Instruction for using mobile banking are easy to follow	7.091	5	1.418	.668	.649
When transaction error occurs I worry that I cannot get compensation from bank	2.604	5	.521	.330	.894
I am over all satisfied with the Mobile banking of my bank	21.684	5	4.337	1.692	.144

Table 11 exhibits the ANOVA results of mobile banking perception for various occupations. The result suggests that there are no significant differences in the performance perception. Since there is no significant difference in any dimensions we accept  $H_{0.5}$ , that here is no significant difference in the customer perception of mobile banking service quality dimensions based on respondents' occupation. This proposition is further supported by the demographic profile which indicate that the majority of the respondents (77%) were either in government service or private service.

## DISCUSSION / CONCLUSION

The factor analysis of the data has given four clear factors. These factors are labeled as "Security/Privacy, Reliability, Efficiency, and Responsiveness". This is on the basis of understanding of customer's perception regarding the mobile banking. It supports the earlier findings of Sharma and Singh (2009). The study found that that Indian mobile banking users are specially concern with security issues like financial frauds, account misuse and user friendliness issue. The study of Mattila (2003) found that relative advantage, complexity, compatibility, observability perceived risk trial-ability are important factors of mobile mobbing. Karjaluo, et al.,(2002) in their study in Finland have mentioned many determinants of mobile banking like low fees, less time consumption, privacy, freedom from time and place. Richardson (2011) found that relative advantage and complexity are most important factors. Perceptions of risk and security concerns appear to slow the adoption rate of mobile banking. Hooper & Zhou (2007) demonstrates that cell phones are more highly regarded by teenagers and students as preferred banking channel.

Various factors may influence customers' adoption. It is argued that adoption will not take place unless customers perceive the service to be useful (Ali & Bharadwaj, 2010). Rao and Prathima (2003) finds that there is huge potential of mobile banking in India but Indian banks offering mobile banking services still have a long way to go. Kolodinsky, et al.,(2004) explored factors that affect the adoption or intention to adopt mobile banking in US. These factors, relative advantage, complexity/ simplicity, compatibility, observability, risk tolerance, and product involvement are associated with adoption. Income, assets, education, gender and marital status, and age also affect adoption.

Gan, et al., (2006) findings stated that in New Zealand, the service quality, perceived risk factors, user input factors, employment, and education were the dominant variables that influence consumers' choice of electronic banking and non-electronic banking channels. Comninos et al. (2008) suggested that consumers will only transact electronically (online/mobile banking) if there is convenience and security.

Bamoriya and Singh (2012) found that 'security concern' is a significant barrier in using mobile banking, it means banks should focus on the security aspect and need to create awareness that it is as secured as traditional banking channel. It also found that Mobile banking usage is not associated with demographic variables except age and education. This findings are in contrast to our finding that there demographic factors can have significant impact on the customer perception. The results based on gender and income of the respondents indicates that safety aspects of mobile banking are the prime concern of the respondents. On the basis of education of respondents it was found that there is significant difference in respondent's perception regarding the ease of use of mobile banking. Those with higher education level find it easy to use the mobile banking in their Smartphone where as undergraduate find it difficult to use mobile banking in their normal mobile phones. It was found that reliability of money transfer and completing a particular transaction are significant factor on the age groups of respondents. There was no significant variation observed on the basis of the occupation of respondents. Though the mobile banking is increasing rapidly but it has not become as popular as the use of ATM hence this is a challenge the bank managers have to face while designing the different features of mobile banking and ensuring the reliability and safety/security of mobile banking transaction. Higher education level in National Capital Region Delhi provides the opportunity to the banks to create awareness and promote the use of mobile banking.

### **MANAGERIAL IMPLICATION AND FUTURE DIRECTIONS**

This study and many other studies have found out four dimensions of mobile banking service. Banking practitioners and managers can use these dimensions to measure the effectiveness of service provided by them. The finding can be used to manage organisation resources and provide higher quality of services to their customers. This will result in retaining of customer and their by lowering the cost of acquiring new customer. They may give special attention to the factors such as security/safety aspects and easy transaction through mobile, which will further enhance the confidence levels of the customer in using this facility and will have a positive impact on the customers perception. Younger age group and those who are in service either in private sector or government sector, constitute the majority of the users of the mobile banking, therefore immediate attention is required from the bank managers and service providers to ensure better service quality to this huge technology savvy customer segment. High education level of this segment provides a huge opportunity for the bankers to convert them from traditional banking to the mobile banking provide that the security of transaction and privacy issues are given top priority so that they can have favorable perception towards mobile banking. The banks have already taken many steps in this direction, and they may continue to enhance their security systems so that frauds and loss of information / money does not take place.

## REFERENCES

- ACI Worldwide ( 2012), "Vast international differences in mobile payments and banking"  
Retrieved from: <http://www.aciworldwide.com/en/transaction-articles/2012/march/feature-article-2-aci-worldwide-survey.aspx> accessed on 11-09-2013.
- Al-Ashban, A. A. & Burney, M. A. 2001. Customer adoption of tele-banking technology: the case of Saudi Arabia. *International Journal of Bank Marketing*, 19 (5), 91-200.
- Ali, Sadia Samar, & Bharadwaj, R.K. (2010). *Factor analysis approach of decision making in Indian e-banking: a value adding consumer's perspective*. Retrieved from <http://inderscience.metapress.com/app/home/contribution.asp?referrer=parent&backto=issue,2,6;journal,3,18;linkingpublicationresults,1:120361>
- Anayasi, F.I. and Otubu P.A. (2009). Mobile Phone Technology in Banking System: Its Economic Effect. *Research Journal of Information Technology*, 1(1), 1-5.
- Ashta, A (2010). Evolution of Mobile banking Regulations. Retrieved from <http://www.arraydev.com/commerce/JIBC/0306-04.htm> accessed on 02-08-2013
- Banzal S. (2010), —Mobile Banking & M–Commerce and Related Issues, Retrieved from: [www.public.webfoundation.org/.../25.Mobile\\_banking\\_M-commerce\\_15.03.pdf](http://www.public.webfoundation.org/.../25.Mobile_banking_M-commerce_15.03.pdf) accessed on 10-08-2013
- Barnes, S.J., & Corbitt, B. (2003). Mobile banking: concept and potential. *International Journal of Mobile Communications*, 1 (3), 273-288.
- Black, N. J., Lockett, A., Ennew, C., Winklhofer, H. & McKechnie, S. (2002), Modelling consumer choice of distribution channels: an illustration from financial servicesII, *International Journal of Bank Marketing*, 20 (4), 161-173
- Camner, G., and Sjöblom, E. (2009). Can the success of M-PESA be repeated? A review of the implementations in Kenya and Tanzania. *Valuable Bits*. Retrieved from: [http://mobileactive.org/files/file\\_uploads/camner\\_sjoblom\\_differences\\_ke\\_tz.pdf..](http://mobileactive.org/files/file_uploads/camner_sjoblom_differences_ke_tz.pdf..)
- Clark, Adam (2008). Mobile banking & Switching. Retrieved from [www.mcom.co.nz/assets/sm/163/.../CriticalSwitchingEvents-WhitePaper.pdf](http://www.mcom.co.nz/assets/sm/163/.../CriticalSwitchingEvents-WhitePaper.pdf)
- Comninos, A., Esselaar, S., Ndiwalana, A., & Stork, C. (2008). Towards evidence-based ICT policy and regulation m-banking the unbanked. Retrieved from [http://externo.casafrika.es/aeo/pdf/english/overview\\_part\\_2\\_09\\_aeo\\_09.pdf](http://externo.casafrika.es/aeo/pdf/english/overview_part_2_09_aeo_09.pdf)
- Dasgupta, S., R. Paul, and S. Fuloria, (2011), "Factors affecting behavioral intentions towards mobile banking usage: Empirical evidence from India," *Journal of Marketing*, 3(1), 6-28.
- Dixit, N. and Datta, S.K. (August, 2010). Acceptance of E-banking among Adult Customers: An Empirical Investigation in India. *Journal of Internet Banking and Commerce*, 15(2), 1-17.
- Gupta, Sunil (2013). "The Mobile Banking and Payment Revolution." *European Financial Review* (February–March 2013), 3–6. Retrieved from: <http://www.europeanfinancialreview.com/?p=996>
- Gan, C., Clemes, M., Limsounchai, V., & Weng, A. (2006). *A logic analysis of electronic banking in New Zealand*. *International Journal of Bank Marketing*, 24 (6), 360-383.
- Hair J F, Black W C, Babin B J and Tatham R L (2006), *Multivariate Data Analysis*, 6th Edition, Prentice-Hall, Englewood Cliffs, NJ.

- Hayat Muhammad Aslam (2009), —Mobile payments: Will Colombo keep its leadership in South Asia? Retrieved from: <http://sundaytimes.lk/090712/FinancialTimes/ft323.html> accessed 23-07-13.
- Hooper, V. & Zhou, Y. (2007). Addictive, dependent, compulsive? A study of mobile phone usage. *20th Bled eConference eMergence: Merging and Emerging Technologies, Processes, and Institutions* Bled, Slovenia, June 4 – 6.
- Ivatury and Mas, 2008 Ivatury, G. and Mas, I. (2010).The Early Experience with Branchless Banking. Focus note no. 46. Retrieved from: [www.ssrnpapers.com](http://www.ssrnpapers.com) accessed on 22-08-2013
- .Karjaluoto, H. (2002), “Selection Criteria for a Mode of Bill Payment: Empirical Investigation among Finnish Bank Customers”, *International Journal of Retail and Distribution Management*, 30(6),331–339.
- Karjaluoto, H., Mattila, M., & Pentto, T. (2002). Electronic banking in Finland: Consumer Beliefs and reactions to a new delivery channel. *Journal of Financial Services Marketing*, 6 (4), 346-361.
- Kim, G., Shin, B., and Lee, H.G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, 19(3), 283–311.
- Kiran Niti ( 2013), “Mobile banking on the rise in India” accessed on 11 -08-2012 Retrieved from: <http://businesstoday.intoday.in/story/mobile-banking-on-the-rise-in-india/1/191851.html>
- Kolodinsky, J. M., Hogarth, J. M., & Hilgert, M. A. (2004). The adoption of electronic banking technologies by US consumers. International Journal of Bank Marketing, 22 (4), 238-259.*
- Lyman, T.R., Pickens M. & Porteous D. (2008), “Regulating Transformational Branchless Banking: Mobile Phones and Other Technology to Increase Access to Finance”, In: Focus Note 43. Consultative Group to Assist the Poor (CGAP), Washington, DC.
- Luo, X., Li, H., Zhang, J., and Shim, J. P. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking services. *Decision Support Systems*, 49(2), 222-234.
- Mas, I. (2008), —Realizing the Potential of Branchless Banking: Challenges Ahead, In: Focus Note 50. Consultancy Group to Assist the Poor (CGAP), Washington DC.
- Mehta Shalini ( 2012) “Mobile banking in India does not need a one-size-fits-all solution” Retrieved from: <http://www.dnaindia.com/money/1683740/column-mobile-banking-in-india-does-not-need-a-one-size-fits-all-solution> accessed on 12-08-2013
- Mattila M (2003)Factors Affecting The Adoption Of Mobile Banking Services, *Journal of Internet Banking and commerce*. Available at <http://www.arraydev.com/Commerce/Jibc/0306-04.htm>
- Nunnally, J. (1978). *Psychometric theory*. New York: McGraw-Hill
- Peterson, Marcus. (2009). A Brief History of Internet Banking, *EzineArticles*. Retrieved from <http://ezinearticles.com>
- Prerna Sharma Bamoriya and Preeti Singh (2012) *Mobile Banking in India: Barriers in Adoption and Service Preferences , Integral Review - A Journal of Management, 5(1), 1-7.*
- Polatoglu, V.N. & Ekin, S. (2001), —An empirical investigation of the Turkish consumers’ acceptance of Internet banking services, *International Journal of*

- Bank Marketing, 19 (4), 156-165.
- Rao, G. R., & Prathima, K. (2003). Online banking in India. Mondaq Business Briefing, 11 April 2003.
- RBI Retrieved from: <http://businesstoday.intoday.in/story/mobile-banking-on-the-rise-in-india/1/191851.html>
- Richardson, S (2011) Cell Phone Banking Adoption in South Africa, Business and Economic Research, 1(1),1-15.
- Rugimbana, R.,(1995) "Predicting ATM Usage: the Relative Importance of Perceptual and Demographic Factors", International Journal of Bank Marketing,13(4),18-31.
- Scornavacca, E., & Barnes, S.J. (2004). M-banking services in Japan: A strategic perspective. International Journal of Mobile Communications, 2(1), 51-66.
- Scornavacca, E., Hoehle, H. (2006). Mobile Banking in Germany. Sprouts: Working Papers on Information Systems, 6(28). Retrieved from: <http://sprouts.aisnet.org/6-28>.
- Siau, K., and Shen, Z. (2003). Building customer trust in mobile commerce. Communications of the ACM, 46(4), 91-94.
- Sharma, P, and Singh, P (2009). Users 'perception about mobile banking- with special reference to Indore & around. Review of Business & Technology Research, 2(1), 1-4
- Suoranta, M. (2003), —Adoption of mobile banking in FinlandII, Jyväskylä Studies in Business and Economics, Retrieved from: <https://jyx.jyu.fi/dspace/handle/123456789/13203> accessed on 03-08-2013
- Telecom Report May 2010 TRAI, India. accessed on 03-08-2013 Retrieved from: [http://www.trai.gov.in/WriteReadData/UserFiles/Documents/AnnualReports/ar\\_10\\_11.pdf](http://www.trai.gov.in/WriteReadData/UserFiles/Documents/AnnualReports/ar_10_11.pdf)
- Tiwari, Rajnish & Stephan, Buse (2007), —The Mobile Commerce Prospects: A Strategic Analysis of Opportunities in the Banking Sector accessed on 03 -07-2013 Retrieved from: [http://www.globalinnovation.net/publications/PDF/HamburgUP\\_Tiwari\\_Commerce.pdf](http://www.globalinnovation.net/publications/PDF/HamburgUP_Tiwari_Commerce.pdf)
- Unnithan, C.R. & Swatman, P. (2001).Online banking Adaptation and Dot.Com Viability: A Comparison of Australian and Indian Experiences in the Banking Sector, School of Management Information Systems, Deakin University, Retrieved from: <http://dro.deakin.edu.au/eserv/DU:30004743/unnithan-dodotcomsadd-2002.pdf>
- Vyas, Charul (2009). Mobile banking in India - Perception and Statistics. Vital Analytics. Retrieved from <http://www.telecomindiaonline.com/telecom-india-daily-telecom-station-mobilebanking-in-india-perception-and-statistics.html>
- Wang, Y., Wang, Y., Lin, H., & Tang, T. (2003). Determinants of user acceptance of internet banking: an empirical study. International Journal of Bank Marketing, 14 (5), 501-519.