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Adoption and Use of Mobile Banking in India

An Empirical Study of Banking Transformation

ABSTRACT

In the advent of information technology, Indian banking sector is transforming in its structure, work culture, systems and procedure. Different technological advancements have changed the face of banking business where electronic system, in terms of different e-channels draw banker and customer attention to experience innovative services. Among these, mobile banking is almost untouched area in Indian banking context. Present study is an attempt to analyze the adoption and usage of mobile banking service among Indian banking customers as well as banks. The paper concludes that mobile banking services are at its infancy where a lot of efforts are required to further develop this technology in Indian banking sector. Customers do not prefer mobiles for banking services due to high charges, slow data transmission and insecurity. The paper suggests improving the technology and spreading awareness among the masses.

1. INTRODUCTION

Banking sector is a catalyst in economic growth of a country and witnessing tremendous changes because of domestic changes in political, social and economic environment. Because of the changed role envisaged for the banking sector, the organizational and capital structure, work culture, role of human resources, systems and operations of banking are also changing. The recent transformation in banking system helps to keep pace with globally changing environment. These changes have brought in immense competition among the banks. Each bank wants to grow in every direction to maintain its identity in the competitive environment. Earlier, banks were keen to meet social objective along with profit maximization but, now they are customer centered because customers are more knowledgeable, aware of every aspect and expect more from their banks. Customers' increasing expectations have made the customers central point of banks.

Today's ebanking is the most convenient service where customers are served through ATMs, credit cards, internet banking, mobile banking, tele banking etc. New private sector and foreign banks have an edge over public sector banks as far as adoption of technological advancements is concerned. Now, technological innovations serve as tool to gain competitive edge in international market.

Mobile banking helps the customers to perform a lot of wide range of transactions on cellular phones. To avail the facilities of mobile banking, customer can ask either through SMS or by using WAP (Wireless Application Protocol) technology, which allows online access of the web using mobile device. This technology serve to check details, issue new cheque book, payment of bills, instruction to stop payment, other value added services etc. This system makes banking location independent. It provides 24 hours banking facility to the customers with no time and location constraints at banking environment. It is also a time saving facility and banks are beneficiary to earn good amount of income and gain image in the market. In the present days, it is gaining momentum in usage by the customers.

The present paper is organized in four parts. After brief introduction to the

theme, second part exhibit the various research studies on mobile banking and also describe the research methodology along with objectives and hypothesis. Third part discusses the findings whereas last part concludes the study with some measures to improve mobile banking services.

2. LITERATURE REVIEW

M-banking refers to provision and availment of bank related financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information (Tiwari, et al., 2006a). By harmonizing services offered by the banking system, such as ATMs, smart cards, point-of-sale networks, and internet resources, the mobile technology offers a convenient additional method for managing money without handling cash (Karjaluoto, 2002). Financial institutions, which have had difficulty in providing profitable services through traditional channels to poor clients, see m-banking/m-payments as a form of branchless banking (Ivatury & Mas, 2008), which lowers the costs of serving low-income customers.

There is no universal form of m-banking because regulatory factors, which can vary dramatically from country to country, play a strong role in determining which services can be delivered via which institutional arrangements (Mortimer- Schutts, 2007). Government regulators are working out the legal implications of the technologies, particularly concerning security and taxation. As recently, the Reserve Bank of India, to enable, 'Safe, Secure, Sound and Efficient Payments and Settlement System', has on September 19, 2008 issued draft operating guidelines on mobile banking transactions in India for the safe and secure mobile banking services. RBI has mandated that only banks who have implemented the core banking solution can offer mobile banking services and these services are restricted only to customers who hold banks' credit/debit cards (IAMAI, 2009).

The uptake of m-banking/m-payments systems has been particularly strong in the Philippines, where three million customers use systems offered by mobile operators Smart and Globe (infoDEV, 2006); in South Africa, where 450,000 people use Wizzit ("the bank in your pocket") (Ivatury & Pickens, 2006) or one of two other national systems (Porteous, 2007); and in Kenya, where nearly two million users registered with Safaricom M-Pesa system within a year of its nationwide rollout (Ivatury & Mas, 2008; Vaughan, 2007).

Harper, (2003) examined that m-banking/m-payments systems may increase the volume or frequency of existing transactional patterns rather than alter the target of those transactions. As in the Manila focus group, of the 10 people using the system, only one had used it to trade with somebody that they had not previously traded with using another channel, women who had used the service to start her own informal money lending business (Donner, 2007b). Tarasewich, et al. (2002) have also identified a number of problems such as management of viruses, security of data transmitted over wireless networks and control of mobile device location data. Singh, (2007) examined that as people come bank for the first time via the mobile handset, require a command over mobile technology concepts. In reality, trust itself is a multifaceted concept, which must be handled carefully in any analysis of m-banking/m-payments use (Benamati & Serva, 2007). They can trust the interface, the network across which their funds travel, the representatives of the institutions (channels)

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who control their money, and/or trust the institutions themselves (Maurer, 2008).

There are some efforts to use the mobile channel to service formal credit from banks or microfinance institutions, but at the time of our study in mid-2007, there were no m-banking/m-transfers services available to non-banking mobile users in India (Donner and Tellez, 2008).

Scholarly research on adoption and impacts of mobile banking in the developing world is scares (Maurer, 2008). In India also, there is lack of research on mobile banking that adequately address implementation and adoption of mobile banking in India. This research gap inspires to investigate the issues and problems of adoption and usage of mobile banking services among Indian customers.

3. RESEARCH METHODOLOGY

Present study is based on mobile banking services in Indian banking industry, where the trend and growth of mobile banking branches is analyzed among four bank groups i.e. G-I (Public sector banks), II (Old private sector banks), III (New private sector banks), IV (Foreign banks) and on industry level.

To check the impact of mobile banking on profitability, profitability ratio (net profits as percentage of working funds) has been calculated for the selected bank groups and impact of mobile banking is analyzed through correlation and regression analysis with the help of SPSS 17.00 version. The data is taken for 11 years from 1996-97 to 2006-07 which is divided into two parts; pre and post-ebanking period to analyses the change in contribution of mobile banking in profitability.

To analyze the mobile banking services' status, questionnaire survey was conducted in urban Punjab. 384 customers with three or more years of relation with banks were surveyed. The survey was conducted in mid January 2009 to mid June 2009. The questionnaire consists of questions related to mobile banking. The analysis is based on bank groups, age, income and occupation of the customers. The data is analyzed through percentage method, weighted average score (WAS) is also calculated to draw the overall results from the survey. Chi-square, f-test and co-efficient of contingency are also calculated to test the hypothesis.

4. FINDINGS

a) Status of Mobile Banking Branches: Mobile banking is also trendy even prior to the internet banking which is mainly availed for balance checking, billing and other account related instructions to the banks. Table 1 highlights the major findings where G-III steals a look with 31.85 pc average comparatively G-I & II and industry view just 2 pc average during pre-ebanking period. Post-ebanking period shows improvement incase of all bank groups where G-III again takes a lead with 70.29 pc average about 5 to 7 times more than G-I, II and industry. Combined average also foresees an explosive gap between partially IT-oriented and fully IT-oriented banks that can't be ignored. Gap between pre and post ebanking period signifies growth in mobile banking services in post-ebanking period, where also fully IT-oriented banks capture a look reporting more than 30 pc growth but partially IT-oriented banks demonstrate not even 15 pc growth. Rather partially IT-oriented banks are far behind by way of 5 to 7 times lesser average mainly due to greater variations along with other factors.

Generally, it is concluded that post-ebanking period is steadier with the utmost effect on G-III. This is due to encouraging contribution of IT, the most productive stick

Table: 1
Mobile Banking Branches as percentage of Total Branches (Percent)

Period	Years	G-I	G-II	G-III	G-IV	Industry
Pre- ebanking	**1996-97**	0.21	0.00	4.99	9.81	0.99
	1997-98	0.64	0.00	8.20	13.89	1.60
	1998-99	1.37	0.00	34.78	20.45	1.87
	1999-2000	2.31	2.28	46.71	22.65	1.96
	2000-01	3.49	6.92	64.59	40.71	3.68
	Average	**1.60**	**1.84**	**31.85**	**21.50**	**2.02**
	S.D.	**1.32**	**3.01**	**25.41**	**11.90**	**1.00**
	C.V.(%)	**82.50**	**163.59**	**79.78**	**55.35**	**49.50**
Post-ebanking	**2001-02**	4.14	7.17	69.64	40.14	3.88
	2002-03	5.48	12.56	72.73	45.00	5.54
	2003-04	7.68	13.57	71.21	44.24	7.16
	2004-05	11.52	13.45	56.60	75.89	8.49
	2005-06	15.84	17.80	69.26	46.96	11.20
	2006-07	24.91	24.94	82.32	57.31	25.46
	Average	**11.60**	**14.92**	**70.29**	**51.59**	**10.29**
	S.D.	**7.79**	**5.97**	**8.25**	**13.22**	**7.84**
	C.V.(%)	**67.16**	**40.01**	**11.74**	**25.63**	**76.19**
Combined Average	**7.05**	**8.97**	**52.82**	**37.91**	**6.53**	
Avg. Techonology Gep.	**10.00**	**13.08**	**38.44**	**30.09**	**8.27**	

Source: Information collected through IT Dept., IBA Mumbai

of competition. IT, along with other factors is managing tool of transformation that lacks in partially IT-oriented banks.

b) Mobile Banking and Profitability: Table 2 shows the relationship between mobile banking and profitability of four bank groups and banking industry. Mobile banking has negative impact on profitability of whole banking industry in pre-ebanking period while in post-ebanking period, G-IV and industry as a whole have been succeeded to turn the impact to positive though it is insignificant. Hypothesis is accepted because mobile banking has insignificant impact on profitability of whole banking industry rather it is negative in partially IT-oriented banks. It is important to note that mobile banking has improved the contribution in post-ebanking period though it is not significant whereas G-III shows the poor results with largest negative impact of mobile banking on profitability which is an indication of poor management of IT. Therefore, partially IT-oriented banks demand greater attention to improve mobile banking and overall IT advancements because poor management and inappropriate use is worst than not to use.

c) Adoption of Mobile Banking Among Customers: The internal consistency of total 384 responses is tested by computing Cronbach's Alpha with the help of SPSS 17.00 which is based on the average correlation of items. In this analysis, value of alpha for all the items is 0.699 which is above 0.60. Therefore, the proposed items are sound enough to measure the customer perception about ebanking and hence, can be used for further analysis.

d) Respondents' Profile: Among the 364 customers, 37.50 pc are between 26 and 35 years of age and 35.94 pc are below 25 years. 40.10 pc customers are those having Rs.1 to 2 lakhs annual income and 39.06 pc are the rich ones while rests have less than Rs.1 lakh annual income. Occupation based sample is more concentrated towards service class i.e. 49.74 pc respondents while businessmen and professionals are 20.31 pc and 29.95 pc respectively. Overall, survey signifies mixture of different categories where youngsters, rich people, servicemen cover the major part of the survey.

e) Awareness of Mobile Banking: WAS below 1 reflects meager awareness of mobile banking among the customers. Statistical

Table: 2
Correlation Co-efficient between Profitability and Mobile Banking

Period	Variables	Mobile Banking	R^2
Pre-ebanking	G-I	-0.506	0.2560
	G-II	-0.094	0.0088
	G-III	-0.980*	0.9604
	G-IV	-0.866	0.7500
	Industry	-0.708	0.5013
Post-ebanking	G-I	-0.161	0.0259
	G-II	-0.381	0.1452
	G-III	-0.205	0.0420
	G-IV	0.258	0.0666
	Industry	0.088	0.0077

*Note: * Correlation is significant at the 0.01 level (2-tailed)*

value of chi-square is significant only in case of occupation which means that customers' perception depends on occupation where business class has immense awareness as WAS is 0.64. Co-efficient of contingency also signifies enormous association among the perception of customers from different occupation. But, insignificant value of f-test results in acceptance of null hypothesis which means that there is insignificant difference between customers' perception with respect to each category. Table 4 shows 0.52 overall WAS which reflects the facts that customers are not much aware of mobile banking. Hence, the banks should plan some effective strategies to popularize mobile banking among the customers especially young, poor and service class.

f) Preference of E-Channels among the Customers: Among all e-channels, ATM is the most preferred e-channel among the customers. Table 5 reveals that credit cards with 58.49 average score are at second rank followed by online banking (average score 53.54), though the difference between average scores is very high. But mobile banking (37.14 average score) and tele banking are not much preferred among the customers because these channels have gained very low average score. Awareness of these e-channels is also very little (deduced from table 4) which is a major cause of concern. Hence, the banks should frame out

Table: 3
Respondents' Profile

Groups	Sub-Groups	Numbers	Response Percentage
Bank Groups	Public	128	33.33
	Private	128	33.33
	Foreign	128	33.33
Age (Years)	Up to 25	138	35.94
	26-35	144	37.50
	36-45	63	16.41
	Above 45	39	10.16
Annual Income (Rs. in Lakhs)	Up to 1	80	20.83
	1-2	154	40.10
	Above 2	150	39.06
Occupation Lakhs)	Service	191	49.74
	Business	78	20.31
	Professional	115	29.95
Indian Banking Industry as a Whole		384	100.00

Source: Survey Results

effective strategies to make these e-channels popular among the masses.

g)Comparative Analysis of Motivational Factors to Prefer E-Channels: All the factors have significant deliberation while customers regard time saving as the most important feature followed by cost effectiveness (Table 6). While in case of G-II, III and industry, cost effectiveness is the most significant aspect but security and efficient services are the least effective ones among three bank groups. WAS is the highest in case of G-III which means that foreign banks' customers are more receptive towards these factors. Hence, the banks should make mobile banking cost effective, time saving with quick response to make it popular among the masses.

h) Functions through Mobile Banking: Mobile banking is also of much practice for balance enquiry while bill payment request is at second rank though average score is lower (Table 7). View of last three transactions and account statement request are in succession but view fixed deposit details is the least preferred function through mobile banking. Therefore, the customers like better mobile

Table: 4
Awareness about Mobile-Banking (Percent)

Group/Sub Groups		Very Little	A Little	UD	Some Extent	Large Extent	WAS	Chi-Square, C, F-test
Bank Group	**G-I**	9.38	14.06	11.72	53.12	11.72	0.44	7.79
	G-II	7.03	17.97	10.94	44.53	19.53	0.52	0.14
	G-III	9.38	12.50	10.16	45.31	22.66	0.59	0.55
Age Wise (Years)	**Upto 25**	5.07	18.12	11.59	47.10	18.12	0.55	10.15
	26 – 35	11.81	12.50	12.50	47.22	15.97	0.43	0.16
	36 – 45	6.35	11.11	7.94	53.97	20.63	0.71	1.02
	Above 45	12.82	17.95	7.69	41.03	20.51	0.38	
Income (Rs. Lakhs)	**Less than 1**	7.50	13.75	20.00	47.50	11.25	0.41	12.76
	1 -2	9.74	14.29	9.74	49.35	16.88	0.49	0.18
	More than 2	8.00	16.00	7.33	46.00	22.67	0.59	
Occupation Wise	**Service**	8.38	13.61	13.61	51.83	12.57	0.47	17.96*
	Business	6.41	20.51	2.56	43.59	26.92	0.64	0.21
	Professionals	10.43	13.04	12.17	43.48	20.87	0.51	0.59
Overall Results		**8.59**	**14.84**	**10.94**	**47.66**	**17.97**	**0.52**	

*Source: Survey Results Note: ** Chi-square and f-test is Significant at 1% (p=0.01) level * Chi-square and f-test is Significant at 5% (p=0.05) level*

Table: 5
Preference of E-Channels among the Respondents

Item	Average Rank	Average core	Rank
ATM	1.59	78.23	1
Credit Card	2.58	58.49	2
Mobile Banking	3.64	37.14	4
Online Banking	2.82	53.54	3
Tele-Banking	4.35	23.02	5

Source: Survey Results

banking for balance enquiry where a foremost cause for the same is less awareness of mobile banking among the customers

i) Satisfaction from Mobile Banking Services: Although 64.33 pc customers are satisfied from mobile banking services still others are not and even 20.31 pc unable to decide. Table 8 shows 0.58 overall WAS which is an indication of meager satisfaction among the customers even though the perception varies with respect to bank groups (deduced from significant value of f-test) and ebanks (G-II & III) have more satisfied customers of mobile banking technology but customers have almost similar opinion with respect to age, income and occupation because f-test shows insignificant value in these cases. Chi-square demonstrates significant value in case of bank groups and occupation which means that customer perception significantly depends on their respective bank groups and occupation but in case of age and income, variations are due to sample fluctuations.

j) Problems of Mobile Banking Services: Though mobile banking is not much popular among the customers of Indian banks still it is

Table: 6
Comparative Analysis of Motivational Factors for the Preference of E-Channels

Statements/Bank Groups	Public Sector Bank		Private Sector Bank		Foreign Banks		Bank Industry	
	WAS	Ranks	WAS	Ranks	WAS	Ranks	WAS	Ranks
Cost effective	1.51	2	1.51	1	1.68	1	1.57	1
Convenient access	1.47	3	1.48	2	1.54	2	1.50	2
Information accuracy	1.46	4	1.23	4	1.41	4	1.37	4
Efficient services	1.32	5	1.17	5	1.33	5	1.27	5
Security	1.15	6	1.12	6	1.30	6	1.19	6
Time saving	1.55	1	1.38	3	1.48	3	1.47	3

Source: Survey Results

problematic. It is evident from table 9 that high charges for mobile banking services is a major problem among all bank groups in the opinion of 43.23 pc customers whereas slow transmission speed, complicated process of use, more errors and less security are rare problems. Majority of the customers consider mobile banking safe in public sector banks. Private sector banks have rare problems whereas foreign banks' mobile banking is considered as more costly. Insignificant value of chi-square concludes acceptance of null

Table: 7
Functions Preferred by the Customers through Mobile Banking

Item	Average Rank	Average Rank	Rank
Balance enquiry	2.51	74.84	1
Request for bill payment	3.83	58.43	2
Cheque book request	5.18	41.50	7
Account statement request	4.53	49.67	4
View last three transactions	4.35	51.82	3
Enquiry for cheque status	4.74	46.97	5
Stop payment on cheque	4.98	43.98	6
View fixed deposit details	5.88	32.81	8

Source: Survey Results

Table: 8
Satisfaction from the Performance of Mobile Banking (Percent)

Group/Sub Groups		HDS	DS	UD	S	HS	WAS	Chi-Square, C, F-test
Bank Group	**G-I**	3.91	18.75	23.44	44.53	9.38	0.37	20.77**
	G-II	0.78	7.81	21.09	62.50	7.81	0.69	0.23
	G-III		14.84	16.41	54.69	14.06	0.68	5.30**
Age Wise (Years)	**Upto 25**	2.17	12.32	23.19	50.72	11.59	0.57	13.71
	26 – 35	1.39	10.42	20.83	57.64	9.72	0.64	0.19
	36 – 45	1.59	25.40	17.46	49.21	6.35	0.33	2.34
	Above 45		12.82	12.82	58.97	15.38	0.77	
Income (Rs. Lakhs)	**Less than 1**		12.50	28.75	46.25	12.50	0.59	8.95
	1 -2	1.95	13.64	21.43	53.25	9.74	0.55	0.15
	More than 2	2.00	14.67	14.67	58.67	10.00	0.60	0.11
Occupation Wise	**Service**	0.52	12.57	22.51	56.02	8.38	0.59	22.39**
	Business	2.56	21.79	5.13	55.13	15.38	0.59	0.23
	Professionals	2.61	10.43	26.96	49.57	10.43	0.55	0.09
Overall Results		**1.56**	**13.80**	**20.31**	**53.91**	**10.42**	**0.58**	

*Source: Survey Results Note: ** Chi-square and f-test is Significant at 1% (p=0.01) level * Chi-square and f-test is Significant at 5% (p=0.05) level*

Table: 9
Comparative Analysis of Problems with Mobile-Banking (Percent)

Problems/ Bank Groups	Public Sector Banks			Private Banks			Foreign Banks			Bank Industry			Chi-square & C
	Never	Rarely	Often	Never	Rarely	Often	Never	Rarely	Often	Never	Rarely	Often	
High charges	25.00	30.47	44.53	18.75	40.62	40.62	17.19	38.28	44.53	20.31	36.46	43.23	4.44 1.11
Slow speed	24.22	42.19	33.59	21.09	54.69	24.22	19.53	44.53	35.94	21.61	47.14	31.25	6.22 0.13
Complex process	33.59	35.16	31.25	27.34	44.53	28.12	31.25	36.72	32.03	30.73	38.80	30.47	2.85 0.09
More errors	35.16	39.06	25.78	32.03	46.09	21.88	35.16	39.84	25.00	34.11	41.67	24.22	1.61 0.06
Less security	39.84	38.28	21.88	30.47	37.50	32.03	36.72	42.19	21.09	35.68	39.32	25.00	5.86 0.12

Source: Survey Results

hypothesis which means that customers' opinion appeals equally to three bank groups with respect to problems regarding mobile banking services. Overall, it can be concluded that mobile banking services are more costly according to the majority customers even transmission speed is slow, but they consider it secure in public sector banks. Thus, solution of these problems according to customer expectations can surely make mobile banking more popular among the customers.

k) Solutions to Aware Customers of E-Channels: It is a major problem explored in first table that customers are not greatly aware of mobile banking. Table 10 describes some suggestions to aware the bank customers about e-channels. Among all, advertisement is the most effective source to create awareness in the opinion of majority customers whereas conducting training for customers is at the second rank with 54.06 average score. Information and demo at the counter is at the third rank having 50.42 average score whereas others like demo fares and personal contact programmes are in succession but not much significant (deduced from low level of average score). In general, advertisements and customer training are the most effective source of creating awareness of e-channels.

5. RECOMMENDATIONS

As the empirical results show that customers are not much aware of mobile banking even majority customers are not satisfied from mobile banking services rather preferred for balance enquiry and request to bill payments at the most. In the light of these drawbacks, the following recommendations have been suggested:

Awareness: Only 50 % customers are aware of mobile banking that too is to some extent which is a major cause of concern. The banks must arrange seminars and demo activities to aware the customers about mobile banking services.

Cost Effective: As high charges is major problem, the banks must fix the charges for mobile banking services to the affordable extent especially for young, poor and service class customers.

Improve Speed: Data transmission is slow through mobile banking in customer views. Make the services fast and provide timely and accurate information to the customers.

Innovative Schemes: The banks must employ some special schemes for different category customers as per their requirements.

Security: The banks must confirm secure transactions through recent technological advancements. Mobile banking service should fulfill certain safety criteria e.g. confidentiality, automation, data integrity, non-disputable to ensure customer acceptance.

6. CONCLUSION

The use of mobile phones is remarkably increasing world over. Indeed, across the developing world, there are probably more people with mobile handsets than with bank account (Porteous, 2006). But, mobile banking is not as much popular as ATMs, credits cards and internet banking areas, because of lesser facilities, low data transmission. Customers are not much satisfied from these services. Mobile services are still in their infancy which has a great deal of room for improvement. The need of the hour is to develop mobile banking by spreading maximum awareness, providing services as per customer requirements and solve their problems immediately to satisfy them. In the advent of IT revolution, innovative and quality services are the only survival factor to pace with global competition. Our banks, except few of public sector banks and most of old private sectors banks, are growing regularly, but little more is required to done withstand the international competitive environment.

Vol. 5 No. 1 / April 2010
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