

## Technology in Banks : A Study on E-banking Channels and Formats

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### Abstract

*Commercial banks in India have occupied pivotal position in accelerating the growth of economy in general and inclusive growth in particular. They are instrumental for capital formation, promotion of trade and industry, and development of agriculture. All along, Indian banking has undergone a rapid transformation especially after initiation of the financial sector reforms. Entry of private players has heightened the competition. Technology has come to the rescue of the banks in facing the challenges of stiff competition and meeting the varied expectations of the customers. Technology has changed the face of Indian banking. It is impossible to think of banking operations today without technology. Against this backdrop, this paper highlights the significance of technology in banking operations. The paper discusses the evolution of technology in Indian banking and the progress made by the Indian banks in different E- banking channels like ATM, RTGS, ECS, EFT and card payments.*

**Key words:** *Internet banking, Mobile banking, Service delivery channels, Human intensive banking, Technology intensive banking*

### Introduction

Technology has brought a paradigm shift in the banking operations particularly in the delivery of products and services. Gone are the days where branch banking was obvious for every transaction. Now technology has, obviated the concept of branch banking where most of the transactions are done comfortably without visiting banks. The adoption of technology has thus, freed the banks and their customers from the traditional constraints of time and place and created a shift from traditional brick and mortar branches to alternate channels and new models like 'Any where Banking' and 'Any Time Banking'. These new channels have lead to greater satisfaction of the customers' needs with minimum human intervention. The development of ATM, RTGS, Debit card, Credit card, internet banking and mobile banking have made the banking facilities available to customers on 24X7X365 basis across the world. These innovations have tremendous impact on the service delivery in the form of quick service with low transaction costs to the customers. Use of technology in a large way has enabled the banks to handle large volume of transactions with remarkable ease without any pressure. In addition, it has served as a cost cutting tool by replacing human intensive banking to technology intensive banking. Such radical progress has changed the contours of the banking industry and made remarkable achievement in reducing the manual labour and error free service. Regulatory authority (RBI) has also witnessed the technology in discharging the operations of the banks and has encouraged the banking industry to implement the technology in its multiple areas like funds management, human resources management (HRM), customer relationship management (CRM), risk management and data base management.

This thinking compelled us to pursue a study on progress made by the banks in adopting technology in their operations. In this backdrop, this paper focuses on the evolution of technology in Indian banking and assesses the progress made by the Indian banks in e-channels over the years. The discussion on technological innovations and progress made by the Indian banks in this paper, cover paper Vs electronic transactions, progress in branch computerization, expenditure incurred on building IT infrastructure, growth of ATMs, paper based clearing Vs MICR clearing, progress made in RTGS, ECS, EFT/NEFT and card payments. The review of the literature on the chosen theme is made hereunder.

### Review of Literature

Mallya (2009) concludes that the quality of customer service in banks has significantly improved especially due to the entry of IT in banking operations. Technology has enabled the banks not only to cut costs but also upgrade the range of e-banking services. Sonia Chawla and Ritu Segal (2010), point out that information technology allows banks to offer diverse services by utilizing wide ranging public network infrastructure and delivers many important benefits. Namita Rajput (2011) finds that Indian banks have improved efficiency and performance after the advent of IT in recent days. The evolving payment system and other IT enabled culture poses new challenges and opportunities to all the segments of this industry. To leverage on the opportunities provided by the new products, the banks need to ensure that the challenges are adequately addressed.

Swant (2011), demonstrated that the use of technology in expanding banking is one of the key focus areas of banks. The banks in India are using IT not only to improve their own internal processes but also to increase facilities and services to their customers. Narinder Kumar Bhasin (2012), opines that as customers become more sophisticated, it becomes imperative for banks to consider the use of technology to respond to their continuously changing requirements.

However, there are no comprehensive studies to examine the progress made by various e- channels. In view of these gaps the present study assumes greater significance.

### Objectives, Scope and Methodology

The objectives of the study are as follows:

- 1) To present a perspective of the significance of technology in banking operations
- 2) To discuss the evolution of technology implementation in Indian banking industry
- 3) To examine the progress made by the Indian banking in various e- channels

The study is based on secondary data drawn from RBI Annual Reports, Report on Trends and Progress of Banking in India, journals and books. It covers a period of 7 years i.e. from 2006 to 2012. The paper is organized into four sections. The first section discusses the significance of technology in banks, second section focuses on evolution of technology implementation in Indian banks and the third section presents the progress made by Indian banks in various e-channels. The last section concludes the study.

### Significance of Technology in Banks : A Perspective

Technology remains the key driver to all banking developments. It is impossible to think of banking business without technology. It serves the following purposes in banking operations :

**1) Saving in manual labour:** Introduction of technology in banks has made remarkable changes in reducing the manual labour. It has obviated the traditional operations of data using 'pen and ink' as tools

for recording the data in several books, ledgers and registers. This manual service was cumbersome, slow and tardy. It also compelled the customers to wait in a long queue, forcing them to fill several forms involving varied information. Adoption of technology has helped in doing away with such problems and has enabled banking industry to save the manpower by reducing manual labour of both banks and customers.

**2) Reduced errors** Conventional manual operations of banking transactions are slow and lead to many errors in calculations. Application of technology has ensured the banks to reduce the errors in calculations and enabled them to provide error free services to their customers. Computerized documents like printed pass book, statement of accounts, and printed letters to customers etc make a big difference compared to hand written ones in understanding the contents and making an appeal to the customers.

**3) Reduced transaction costs** Cost control is one of the significant aspects where the banks are expected to give due attention so as to face the competitive environment. Savings in cost can be achieved through intelligent adoption and use of technology. Technology allows transactions to take place at a faster and reduced cost even to smaller customers. The cost of bank transactions on manual mode is estimated to be in the range of Rs 45 to Rs 50 while it is around Rs. 15 on ATM and Rs.4 on e-banking (Mally,2009). Banks will get mileage only if more and more transactions are handled through electronic mode.

**4) Better customer relationship management (CRM)** The concept of CRM in banks is playing a significant role in retaining and expanding the customer network. There is a sea change in the contemporary banking industry. Customers have been exposed to higher standards of service and customer orientation. The banks have focused on creating value to customers by building strong customer relations. Banks are providing top class services by offering e-banking products. Technology has enabled the banks to meet the expectations of customers by providing speedy, efficient and low cost services and thereby retaining the existing customers and expanding the new customer network.

**5) Managing the challenges of competition** In the deregulated era, banks are operating in a competitive environment. Technology is a strong weapon to combat the challenges of competition. It has come to the rescue of banks by way of technology to meet the varied expectations of the customers anywhere, any time and in anyway. The banks have taken lead in developing new innovative technology savvy products like debit card, credit card, and interest rate swaps etc that have enabled the banks to beat the competition.

**6) Risk management** It is another area where technology applications are widely used in banking operations. Technology has enabled the banks to sharpen their credit assessment skills. It lays more emphasis in gathering the necessary data for Internal Rating Based (IRB) approaches for credit risk and Advanced Management Approach (AMA) for operational risk. Technology is also used in measuring liquidity risk, forward risk and interest rate risk.

**7) Source of advertisement and better marketability** Technology has replaced the conventional form of approaching the bank customers through news papers and other media for marketing the products and services. Banks have realized that educating the customers makes a good business sense. The banks can now reach their customers and increase the publicity of their products and services and build their corporate image on national and global levels through internet, SMS, and other electronic media. The advent of technology has also enabled the customers to seek information without physically visiting the banks.

**8) Increase in productivity and profitability** Profitability is the function of productivity which directly depends on the use of technology. Operating expenses cost of intermediation, interest margin, deposit and advances per account are the factors on which productivity of banks depends. The business per employee has increased from INR 27.6 million (2006) to INR 62.7 million (2010) and the profit per employee increased from INR 0.12 million (2005) to INR 0.39 (2010) (IDRBT Report 2011). This progress shall be attributed, among others, to the better use of technology by the banks.

**9) Meeting the regulatory requirements** Adoption of technology is also needed by the banks to meet the regulatory requirements such as requirements indicated by the RBI for operation of Off-Site Monitoring Surveillances (OSMOS) Reports on regular basis in E format. Under section 42 of the RBI Act 1934, banks are required to work out their CRR and SLR obligations in electronic format. Adoption of technology was also needed to fulfill the stipulation made by the CVC (Central Vigilance Commissioner) for computerizing at least 70% of bank business by January 2001.

### Evolution of Technology in Indian Banking

The IT revolution had a great impact on the banking industry. It led to the introduction of online banking in India. Initiation on up gradation of technology in banks shall be traced back during the pre-reforms period.

Various committees have been constituted from time to time to explore the possibilities of adoption of technology in Indian banks. RBI appointed a committee in 1984 known as 'Committee on Mechanization in the Banking Industry' under the chairmanship of Dr. Rangarajan. The suggestions of the committee included automation in banks and total computerization of all the branches. The other important recommendations of the committee were setting up of service branches by the banks which had more than 10 branches. These service branches would exclusively be devoted to clearing operations of the bank at that particular centre. It had also suggested the introduction of Magnetic Ink Character Recognition (MIRC) technology in all the banks in metropolitan cities of India resulting in use of standardizing cheque forms and encoders.

The 'Committee on Communication Net-work for Banking and SWIFT Implementation' was appointed in 1987 under the chairmanship of TNA Iyer. The committee suggested for setting up of X 25 based Packet Switching net work called 'BANKNET' to be jointly owned by the RBI and PSBs.

'Committee on Computerization in Banks' was appointed again in 1988 under the chairmanship of Dr. Rangarajan. The committee focused on the computerization of the settlement operations in the clearing house managed by RBI, branch level computers and establishment of connectivity between branches. It has also suggested the modalities for implementation of online banking and introduction of one way collection of cheques drawn on the four metros received from Ahmedabad, Bangalore, Nagapur and Hyderabad.

In 1994 the 'Committee on Technology Issues' relating to payment system, cheque clearing and securities settlement in Banking Industry' was appointed under the chairmanship of W.S. Saraf. The committee suggested the establishment of Electronic Fund Transfer (EFT) system with BANKNET communication net work as its carrier, enactment of suitable legislation on the lines of the Electronic Fund Transfer Act of 1978 of USA, introduction of MIRC clearing at all centers with more than 100 bank branches, introduction of delivery Vs payment system for SGL transactions and introduction of ECS credit for low value of repetitive transaction such as interest, salary pension payment, electronic debit clearing for payment to utility companies.

The 'Committee for Proposing Legislation on Electronic Fund Transactions and other Electronic Payment' was appointed in 1995 under the chairmanship of Smt. K.S. Shere. The committee suggested for a new legislation for regulating, defining and determining the rights and obligations of the system providers and users. The other recommendations of the committee included, immediate introduction of EFT system by framing regulations under section 58 of the RBI Act, and adaptation of model customer contract agreement to govern the banker customer relationship with regard to EFT.

The Narasimham Committee Report (1998) pointed out the slow progress in implementing the technology by Indian banks. The committee suggested for implementation of the necessary legislative changes as well as addressing the issues such as electronic record keeping, data protection, and implementation of digital signature. In 1998 'Committee on Technology Up-gradation in the Banking Sector' was appointed under the chairmanship of Dr. A. Vasudevan. The committee suggested to expedite intra-bank net working and set up a net-work of regional data warehouse by RBI to enable updated data for risk assessment. Further, it also suggested for outsourcing of technology and services, computerization of government transactions and technology plan for banks.

The Government of India initiated steps for promoting Information and Technology Act of 1999. Further, RBI has taken measures to strengthen Information and Technology Act enacted by the Government of India which provided legal recognition to electronic transfer and other means of electronic communications. INFINE (Indian Financial Network) satellite based wide area of network using VAST technology was set up by RBI in 1999. To give fillip to the growth of E-payment system, the 'RTGS' (Real Time Gross Settlement) system was introduced in 2004. Further, the RBI waived off processing charges in 2006. NEFT (National Electronic Fund Transfer) as a replacement of EFT (Electronic Fund Transfer) was introduced in 2005. To ensure timely settlement of disputes between system providers and system participants, a Dispute Resolution Mechanism (DRM) was framed in 2007 and a time frame of maximum 15 days has been laid down for resolution of disputes.

### **Progress in Technological Innovations Made By the Indian Banks**

Technology has changed the contours of the banking industry all over the globe. Indian Banking too witnessed tremendous transformation in reaching its customers through alternate channels and made rapid progress to meet the changing requirements of customers. The changing technological face of Indian banking is discussed from the point-of-view of the following:

#### **Share of Paper Based Vs Electronic Transactions**

There is a drastic change in the payment system of business and household transactions over the years. It is practically inconvenient to handle paper based transactions that need physical delivery of paper involving huge amount of funds with innumerable transactions. These manual oriented transactions are time consuming and costly. Slowly paper based transactions are replaced with electronic mode. Table 1 indicates that the paper based transactions have occupied a major share in terms of volume ranging from 82% (2006) to 52.4% (2012) over the period of 7 years. Though the paper based transactions constitute a major share, there is consistent decline in the volume of paper based transactions and a steady increase in e-based transactions. Further it is evident that there is remarkable increase in the value of electronic based transactions ranging from 70.8% (2006) to 91.6% (2012). There is a consistent decline in value of paper based transactions from 29.2% (2006) to 8.4% (2012). It is clear that the payment business in India has experienced a rapid change. There has been a growing acceptance of electronic payments system across the nation. The shift from paper based to non-paper

mode of payment shall be attributed to the vigorous steps taken by the RBI to promote the usage of electronic mode of payment. These payments are safe, secure, cost effective and efficient.

### **Computerization of Operations and Investments in Information Technology**

As per the RBI guidelines, the banks have initiated various measures to foster the use of technology and the process of computerization in their operations. It is noticed that the technology has provided an opportunity to the banks to reach the customers speedily with lower cost. This compelled the banks to invest their sizeable funds in information technology. It is pertinent to note that on an average IT constitutes about 20% of the total expenditure of the bank (Sekhar 2008).

Table 2 demonstrates that significant progress has been made by the banks in computerization of their operations at branch level. It has reached almost 100%. The banks have recognized the importance of technology in their operations and have given utmost priority to implement the recommendations of the RBI relating to complete automation and branch computerization. From the table, it is also observed that investment made on technology by the banks are swelling from Rs.10676 Crores (2006) to Rs. 22052 Crores (2010) evidencing 1.06 times increase with an average annual growth of 15.9% over the period of five years. Thus, banks are spending a huge amount of their budget annually on technology to enhance their operational efficiency.

### **Growth in Automated Teller Machine (ATM)**

ATM is an electronic device that provides financial services to the bank customers without the presence of bank employees. It provides a variety of transactions such as cash withdrawal, cash deposit and placement of service requests for banks. It also updates the accounts of the customers after completion of the transactions. ATMs are weather proof and can be installed in shopping malls, busy commercial centers and even in the remote places. They have reduced the transaction and operational costs of the banks as well as of customers. In addition to cost reduction, ATMs have helped banks in customer reach and customer satisfaction etc.

Table 3 indicates rapid progress made by scheduled commercial banks in installation of ATMs, The number of ATMs has increased from 7165 (2006) to 95686 (2012) reflecting an increase of 12.3 times with an average annual growth of 60.28% over the period of seven years evidencing the positive efforts made by the banks to popularize the ATMs. Further, there is also significant increase of ATMs both, in on-site 4812 (2006) to 47545 (2012) and off-site 2353 (2006) to 48141 (2012). The growth in off-site ATMs shall be attributed to the steps taken by the RBI in allowing the banks to open off-site ATMs without obtaining its permission. It is interesting to observe that the number of ATMs have registered an increase of 12.3 times as against the number of branches of 1.38 times over the period of 7 years. The phenomenal increase in ATMs over the branches is the reflection of moving away of customers from 'branch banking' to 'bank banking'.

### **Manual Paper Based Clearing Vs Paper Based Magnetic Ink Character Recognition (MICR) Clearing**

Documentation is the utmost priority in banking particularly in paper based transactions. To obviate the limitations of manual paper based clearing, Magnetic Ink Character Recognition (MICR) clearing is introduced. It is a new innovation which can be used for automatic identification or character recognition to read text and diagrams. Under this, the cheques and documents can be scanned. Customers are the biggest beneficiaries of MICR clearing. It has reduced the time involved in clearing, check frauds, minimises cost and reduces liquidity risk. It has also contributed to shorter clearing cycle. There are 66 major MICR technology centers in India.

As shown in Table 4 there is a marginal increase in the volume of transactions from 1015.9 million (2006) to 1114.5 (2012) with an average annual growth of 5.02%. Whereas the MIRC transaction registered growth from 44.92 trillion (2006) to 80.2 trillion (2012) representing an increase of 0.78 times with an average annual growth of 9.14% over the period of 7 years. Non-MIRC transactions witnessed decline in volume from Rs 254.92 million (2006) to Rs 227 million (2012). In addition the volume of transactions has registered a decline from 18.54 trillion (2006) to 18.3 trillion (2012). This shall be attributed to the receding importance of manual paper based transactions and accelerated growth of paper based MIRC clearing. The increase in volume of MIRC payment is due to enhanced efficiency of paper based electronic clearing transactions that has eliminated the need for physical movement through cheque with introduction of CTC (Cheque Truncation System).

### **Real Time Gross Settlement (RTGS)**

RTGS refers to the technology adopted by the banks for transfer of huge financial transactions instantly both at the national and international levels. In this system, funds shall be transferred from one bank to another on a 'real time' and on 'gross' bases. It means the transaction is settled on one to one basis without bunching of other transactions. RTGS system serves as a faster and convenient mode for settling high value transactions and the beneficiary will receive the funds on the same day of effecting the transactions. This facility is found more useful in case of corporate bodies where they are benefited by instant transfer of funds from different parts of the globe. As on May 2012, there are 84638 bank branches which are providing the RTGS facility which settles on an average 1.8 lakh transactions with value of INR 4 trillion on a daily basis (Narinder kumar 2012).

Table 5 demonstrates that there is a spectacular growth both in volume and value of RTGS transactions. The volume of transactions has registered tremendous growth of 1.77 million (2006) to 55 million (2012) evidencing 30 times with an average annual growth of 24.7% over the period of 7 years. There is also robust increase in the value of RTGS transactions from Rs 115.41 trillion (2006) to Rs 484.9 trillion (2012) representing 3.2 times with an average annual growth of 24.48% during the study period. Thus, RTGS is one of the widely used modes of transfer of funds. It is the reflection of better use of technology by banks which serves as a cheaper mode of funds transfer.

### **Electronic Clearing Service (ECS)**

Electronic clearing service is a mode of transfer of funds through the services of a clearing house using technology. In this system, the remitter and the beneficiary may be of the same or different branches and locations. This facility is more useful to transfer the bulk funds from an account to the various beneficiaries as well as collect funds from various remitters to a single beneficiary. ECS (credit) is used to give credit to various beneficiaries making single debit of an account of the remitter and ECS (debit) is used to give debit to the accounts of various remitters making single credit of the account of beneficiary like institutions. Average monthly volumes are 8.05 million transactions (ECS Credit-NECS, Regional and local) and 13.4 million transactions (ECS Debit-Regional and local,) while monthly values are averaging about INR 126.43 billion and INR 60.6 billion for ECS Credit and ECS Debit respectively (Narinder kumar 2012).

Table 6 reveals that there is a tremendous growth both in volume and value of ECS Debit and ECS Credit transactions. The volume of ECS (credit) witnessed a growth from 44.21 million (2006) to 121.5 million (2012) reflecting an increase of 77.3 times with an average annual growth of 16.7% over the period of 7 years, where as the value of transactions registered growth from Rs 0.323 trillion (2006) to

Rs 1.8 trillion (2012) reflecting an increase of 1.5 times with an average annual growth of 52.54% over the study period. In addition, the volume of ECS (debit) increased from 35.96 million (2006) to 164.7 million (2012) showing 128.7 times increase with an average annual growth of 29.62% over the study period, in terms of value, the ECS (debit) witnessed an increase from Rs 0.129 trillion (2006) to Rs 0.8 trillion (2012) reflecting an increase of 0.68 times with an average annual growth of 35% over the study period. This is the clear indication of spectacular increase in the use of ECS mode of payment that facilitates for the timely settlement of payments as per the standing instructions.

### **Electronic Fund Transfer / National Electronic Fund Transfer (EFT/NEFT)**

EFT was introduced in 2005. It is an online system for transfer of funds of Indian financial institutions. It involves transfer of funds from one account to another account of any bank branch through electronic mode. The exchange takes place between single financial institutions or across multiple institutions through computer based system. It provides 11 hourly settlements on week days and five settlements on Saturday. In this system, it is mandatory to confirm the successful credit given to the beneficiary account. As on May 2012, NEFT facility is introduced in 86449 bank branches settling 1.4 million transactions on a single day (Narinder kumar 2012).

Table 7 indicates that, EFT mode of payment has grown in terms of volume and value. The volume of transaction has swelled from 3.07 million (2006) to 226.11 million (2012) showing an increase of 223 times with an average growth of 85.6% over the study period. It is also observed that there is a spectacular increase in the value of EFT payments from Rs 0.61 trillion (2006) to Rs 17.9 trillion (2012) reflecting an increase of 17.3 times with an average annual growth of 67.18% over the study period. The marked progress shall be attributed to the steps taken by the RBI to strengthen the technology in banking operations.

### **Progress in Card Payments**

Debit and Credit cards are plastic cards used to store information related to customer's account and can be used as alternative method of payment for cash. Such cards reduce cash handling expenses and provide safety by avoiding the risk of loss of cash in transit. They provide the facilities like cash withdrawals from ATM, online purchase, fund transfer and balance check.

Table 8 reveals that the transactions in card payment both in credit and debit has shown a spectacular growth. The volume of credit card payment has registered growth from 156.08 million (2006) to 320 million (2012) reflecting an increase of 164 times with an annual average growth of 11.59% over the study period. In terms of value, it has grown from Rs 0.33 trillion (2006) to Rs 1 trillion (2012) showing an increase of 62 times with an annual average growth of 18.09% over the study period. It is also observed that the volume of debit and credit card transactions registered growth from 45.68 million (2006) to 327.7 million (2012) reflecting an increase of 281 times with an average annual growth of 33.4% over the study period. The value of transactions has also witnessed growth from Rs 0.06 trillion (2006) to Rs 0.5 trillion (2012) with an average annual growth of 36.64% over the study period. It is evident that the card mode of transactions has proved to be advantageous and is widely accepted by the customers all over the country.

### **Conclusion**

Rapid progress has been made towards implementation of technology in Indian banks and several alternate channels have been innovated. Technology has brought key changes in the banking operations and has paved the way for new opportunities in the banking sector. It is proved that E-based transactions

are safe, secure, efficient, and cost effective. It is found that there has been a growing acceptance of E-payments across the nation and shift from paper based to non-paper based mode of payments. RBI has recommended several measures for automation and total branch computerization. Accordingly, almost 100% branch computerization process is completed and banks are spending huge amount of their budget annually on technology. ATM is now the most powerful e-banking channel which has witnessed a rapid progress. The number of ATMs have increased from 7165 to 95986 over the study period. This phenomenal increase is the reflection of the moving away of customers from branch banking to bank banking. As far as manual paper based clearing Vs paper based MIRC clearing is concerned, manual paper based transactions witnessed declining trend against an accelerated growth in paper based MIRC clearing mode of transactions. RTGS has shown a robust increase of transactions both in volume (1.77) million to (7.55) million and value from 115 million to 484 million. ECS mode of transfer of funds showed an enormous increase in debit and credit card transactions both in terms of volume and value. The volume of ECS debit increased from 35.9 million to 164.7 million as against the ECS credit from 44.21 million to 121.5 million. In terms of value, ECS debit has increased from 0.129 trillion to 0.8 trillion against the ECS credit from 0.323 trillion to 1.8 trillion. RBI has taken several steps to strengthen the EFT mode of payment and the EFT mode of transactions swelled from 3.07 million to 226.11 million in terms of volume and 0.61 trillion to 17.9 trillion in terms of value. The study found that the transactions through card payments have emerged as one of the popular modes of E-banking channels. Innovations in the field of e-banking service have made banking safe, secured, efficient and cost-effective. Technology is considered as a boon both, to the bankers and customers. It is a driving force that has enabled the banks to improve the quality of customer services and to enhance their productivity levels.

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**Table 1. Paper based transactions Vs electronic transactions**

Year	Volume		Value	
	Electronic mode	Paper form	Electronic mode	Paper form
2006	18%	82%	70.8%	29.2%
2007	22%	78%	76%	24%
2008	27.1%	72.9%	80.4%	19.6%
2009	32.8%	67.2%	83.9%	16.1%
2010	35.3%	64.7%	88.3%	11.7%
2011	40.9%	59.1%	89.7%	10.3%
2012	47.6%	52.4%	91.6%	8.4%

Source : RBI Annual Reports for the related years

**Table 2. Branch computerization and investment on information technology in PSBs**

Year	Fully computerized Branches	Investment on Information Technology (In Crores)	% of growth of investment
2006	77.5%	10676	-
2007	85.6%	12826	20.13%
2008	94.6%	15016	17.07%
2009	95.7%	17897	19.8%
2010	97.8%	22052	23.2%
2011	NA	NA	-
2012	NA	NA	-

Source : Report on Trends and Progress of Banks in India for the related years.

**Table 3. Branches and ATMs of Scheduled Commercial Banks**

Year	Branches	ATMs	% of growth of ATMs	ATMs On site	ATMs Off-site
2006	34012	7165	-	4812	2353
2007	57042	27088	278%	14796	12296
2008	61132	34789	28.42%	18486	16303
2009	64608	43651	25.47%	24645	19006
2010	69160	60153	37.8%	32679	27474
2011	74130	74505	23.85%	40729	33776
2012	81240	95686	28.42%	47545	48141

Source : Report on Trends and Progress of Banks in India for the related years.

**Table 4. Manual paper based clearing Vs Paper based MICR clearing**

Year	MICR				Non MICR			
	Volume (Million)	% of Growth	Value (Trillion)Rs.	% of Growth	Volume (Million)	% of Growth	Value (Trillion)Rs.	% of Growth
2006	1015.9	-	44.92	-	254.92	-	18.54	-
2007	1125.37	9	54	20.26	223.18	-12.5	16.06	-13.3
2008	1201.4	6.28	60.28	11.62	237.6	6.61	18.67	16.2
2009	1140.5	-1.78	58.49	-2.96	233.6	-16.8	20.61	10.7
2010	1143.16	8.14	66.64	13.91	230.5	-1.34	18.78	-8.83
2011	1155.1	16.36	83	24.56	232.3	0.78	18.3	2.13
2012	1114.5	-2.8	80.2	-3.37	227	-2.28	18.3	-
Average		5.02%		9.14%		-1.5%		0.98%

Source : RBI Annual Reports for the related years.

Table 5. Progress in RTGS transactions

Year	Volume (Million)	% of Growth	Value (Trillion)	% of Growth
2006	1.77	-	115.41	-
2007	3.88	123.7	184.81	60.13
2008	5.84	50.5	273.18	47.8
2009	13.37	128.9	322.7	18.13
2010	33.24	148.6	322.8	0.03
2011	49.3	48.3	394.5	22.21
2012	55	11.56	484.9	22.91
Average growth		24.71%		24.48%

Source : RBI Annual Reports for the related years.

Table 6. Growth in Electronic Clearing Services (ECS)

Year	ECS Credit				ECS Debit			
	Volume (Million)	Growth %	Value (Trillion)Rs.	Growth %	Volume (Million)	Growth %	Value (Trillion)Rs.	Growth %
2006	44.21	-	0.323	-	35.9	-	.129	-
2007	69.02	56.36	0.832	157.58	75.2	109.12	.254	96.89
2008	78.36	13.56	7.822	840.14	127.12	69	.489	92.51
2009	88.39	12.85	0.974	-703	160.05	25.92	.669	36.8
2010	98.55	11.49	1.2	23.2	150.21	6.11	.698	4.33
2011	117.3	19.02	1.8	50	156.7	4.32	.70	1.44
2012	121.5	3.58	1.8	-	164.7	5.1	.80	14.28
Average		16.69		52.56		29.62		35.17

Source : RBI Annual Reports for the related years.

**Table 7. Progress in EFT/NEFT transactions**

Year	Volume (Million)	Growth %	Value (Trillion) Rs.	Growth %
2006	3.07	-	0.61	-
2007	4.77	1.7	0.77	26.22
2008	13.31	179	1.4	81.81
2009	32.16	141.6	2.52	80
2010	66.35	106.3	4.1	62.7
2011	132.3	100	9.4	129.2
2012	226.11	70.9	17.9	90.4
Average Growth		85.6%		67.18%

Source : RBI Annual Reports for the related years.

**Table 8. Progress in Card Payments**

Year	Credit Cards				Debit Cards			
	Volume (Million)	Growth %	Value (Trillion)Rs.	Growth %	Volume (Million)	Growth %	Value (Trillion)Rs.	Growth %
2006	156.08	-	0.33	-	45.68	-	0.06	-
2007	169.53	8.67	0.41	24.24	60.17	31.72	0.08	33.3
2008	228.2	34.61	0.58	41.46	88.3	46.75	0.12	50
2009	259.56	13.74	0.65	12.06	127.6	44.5	0.18	50
2010	234.2	-9.77	0.63	-3	170.1	33.3	0.26	44.4
2011	265.1	13.19	0.80	26.98	237.5	39.7	0.40	53.84
2012	320	20.75	1.00	25	327.5	37.8	0.5	25
Average Growth		11.59%		18.09%		33.4%		36.64%

Source : RBI Annual Reports.