# Emergence of E-Banking in India

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World over, information technology has moved from being a mere tool of automation for existing functions to an important tool in the decision making process and a major element in delivering services to customers. The impact of this change can be found significantly in the banking, financial services, and insurance (BFSI) sector. According to Vij (2006), "I.T. has introduced new business paradigms and is increasingly playing a significant role in improving the services in the banking industry." In this context, Talwar (2008) says that "In the last few years, it is no wonder that the banking sector has seen a virtual cornucopia of new products: credit cards, tele-banking, ATMs, quick collection facilities for outstation cheques, retail EFT, Electronic Clearing Services (ECS), debit and credit for repetitive payments like dividend, interest, utility bills, Internet Banking, etc."

Technological innovations affect banking capacity by changing production costs and spurring disintermediation, increase competition by lowering entry and exit barriers, and help the internationalization process. Technology has shaped banking business both internally and externally: internally by means of the reconstruction of banks' internal organization and production processes and externally by spurring product innovation and establishing new distribution channels.

Varma (2006) states that a bank which moves fast and tries to capture the first mover advantage can think of succeeding in

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this sector. Another key success factor will be the value which the online operations of banks offers to the consumer. Shaw and Yu (2004) assert that the Internet affected the competitive landscape of the banking industry in many ways. First, it changed the industry structure and, in doing so, altered the rules of competitions. Secondly, it created competitive advantages for banks giving them new ways to outperform their rivals. Finally, the internet had spawned the creation of new businesses that were beyond the traditional banking domains.

## Evolution of Technology in Indian Banks

The foundation for induction of computer technology in the Indian banking sector was laid by Dr. Rangarajan Committee's two reports in 1984 and 1989. Both strongly recommended computerization of banking operations at various levels while suggesting an appropriate architecture. In 1993, the employees' unions of banks signed an agreement with bank managements under the auspices of the Indian Banks' Association (IBA). This agreement was a major breakthrough in the introduction of computerized applications and development of communication networks in banks. Since then, banks have started exploring the idea of total bank automation, although, in most cases, it was confined to branch automation only. The vision statement of IBA mentions about leveraging technology as follows:

"To evolve into a strong, sound, and globally competitive financial system, providing integrated services to customers from all segments, leveraging on technology and human resources, adopting the best accounting and ethical practices, and fulfilling corporate and social responsibilities towards all stakeholders."

It also states that the customer would continue to be the centre point of business strategy (Rao, 2004).

In the 1990s, banks started thinking about tying up disparate branches together to facilitate information sharing. Entry of private banks and foreign banks in the banking arena with radically different strategies and huge IT budgets gave a big fillip to e-banking in India. Technology enabled these banks to provide a whole new range of financial products and services at minimal cost.

In the early years, the network and backend infrastructure (composed of servers, workstations, networks, datacenter, bandwidth, etc) was generally decentralized. In other words, each branch had its own server(s), banking applications, database(s), and other such assorted systems. This setup created operational and financial problems in terms of updating applications and troubleshooting as well as a wide gamut of people and support aspects.

New delivery channels like the Internet and mobile required that, irrespective of the branch or channel the customer used, the database be accessed and updated on a real-time basis. The networks had to be up and running and be managed with lesser costs. Realizing the costs and benefits of scale and scope, datacentre architecture also got centralized. This has helped a lot in improving and simplifying the network from the operations, user, and administration perspectives. Subsequently, the network also evolved into a unified IP network.

Centralization of IT infrastructure has led to the implementation of core banking in India. Shyamala Gopinath, Deputy Governor of the Reserve Bank of India says, **"**The banks in India started from a disparate IT infrastructure in general and moved over to consolidation and virtualization of databases and servers gradually over the years in order to achieve efficiency, cost reduction, and improvement in customer services, and to address the issues arising from competition from other market players. The core banking concept to a great extent emerged from this centralization process and has since received a complete and focused attention from all banks for its rapid implementation."

With regard to the implementation of core banking and electronic banking, banks have made considerable progress in recent years as far as the centralization of customers' accounts are concerned; however, we can also think of making it more useful by expanding the coverage of core banking with essential services / banking products like treasury, CRM, corporate banking, MIS, etc.

## Core Banking Applications

Core banking applications help provide complete front and backend automation of banks. Core stands for "centralized online real-time exchange." These applications also help banks achieve centralized processing and provide anywhere, anytime non-stop services. Retention of customers, lowering service costs, standardization of processes within the bank, and optimization of IT infrastructure are other major advantages. General core banking functions include deposit accounts, loans, mortgages, and payments which banks make available across multiple channels. Leading global and Indian core banking application vendors are Misys, Infosys, TCS, Accenture, SAP AG, Oracle, and CSC. Banks having core banking applications are assigned an Indian Financial System Code (IFSC) for various inter-bank and intra-bank transactions.

An RBI report shows that 94.6 per cent public sector bank branches have been fully computerized while 67.7 per cent have installed core banking systems. Allahabad Bank, Canara Bank, Dena Bank, and UCO Bank are laggards with regard to adoption of core banking solution. Branches of Andhra Bank, Indian Overseas Bank, Punjab and Sind Bank, Syndicate Bank, and UCO Bank are least computerized.

## Introduction to E-Banking

An array of banking services offered to retail and wholesale customers through an electronic distribution channel is collectively referred to as e-banking (Rajshekar, 2004). E-banking is a mix of services which include Internet banking, mobile banking, ATM kiosks, fund transfer system, real time gross settlement (payment and settlement system), credit/debit/smart/kisan cards, cash management services, and data warehousing, operational data for MIS, and customer relationship management.

Using telephone banking, the customer can control his bank accounts by giving the bank instructions over the telephone. It has been established that increasing the role of technology in banks can serve to reduce costs and often improve service reliability (Lee, 2002). The motivation of cost reduction has been argued to be the primary reason for banks adopting the Internet platform in recent years (Daniel, 1999; Howcroft, Hewer, and Durkin, 2003).

## Internet Banking or Online Banking

The Internet is increasingly used by banks as a channel for receiving instructions and delivering their products and services to their customers. This form of banking is generally referred to as Internet banking (Rajshekar, 2004). Prohibitive costs of real estate would always make Internet banking a much more viable option in the long run. Internet banking increases operational efficiencies and reduces costs, besides giving a platform for offering value added services to the customer, thereby fulfilling all the essential prerequisites for a flourishing banking industry (De and Padmanabhan, 2006).

Internet banking is often compared with PC banking. Hurst (2006) explains the difference: "PC banking requires special software which can be installed on one's PC and changed every time the bank upgrades its service. Customer can only access the account from one's own PC which is connected directly to the bank's intranet via a modem and a telephone line. Internet banking, on the other hand, offers 24-hour, 7-days-a-week access from virtually anywhere in the world where there is an Internet terminal."

## Internet - Only Bank

These are banks that have no branch network and are exclusive available on the Internet. Some of the Internet-only banks are FNBO Bank, Bancotrasatlantico (erstwhile Griffon Bank), Zions Bank, NetBank, and SFNB. Many of these banks faced resistance and lawsuits from different stakeholders. Because of this, some of them were acquired by other banks while others closed down. An Internet bank is a lot less expensive to run than a high street operation, and is therefore able to pass these savings on to its customers through cheap loans and higher interest rates on savings. In India, hitherto, there are no such banks.

**Advantages and Disadvantages of Online Banking :** Advantages of online banking are convenience, ubiquity, speed of transaction, efficiency (in terms of cost and time), and effectiveness (in terms of scope of activity). Its limitations are registration hassles, navigation difficulties, security and trust, and frequent changes in site features. According to Industry estimates, a bank teller costs at Re 1 per transaction, ATM transaction Re 0.45, phone banking Re 0.35, debit cards Re 0.20, and Internet banking Re 0.10 per transaction (De and Padmanabhan, 2006).

ICICI Bank was the first to adopt internet banking in India providing the services by the name INFINITY. Citibank, IndusInd Bank, HDFC Bank, and Timesbank (now part of HDFC Bank) were also the early ones to adopt this technology in 1999. PSU banks have remained laggards in the race for adopting Internet banking practices. There are very few nationalized banks such as State Bank of India, Bank of Baroda, Allahabad Bank, Syndicate Bank, and Bank of India that offer Internet banking services. Despite positive news like this, PSU banks still have a lot of catching up to do on the Internet banking services front (De and Padmanabhan, 2002). An empirical study of Malhotra and Singh (2006) of 88 banks for the period of 1998-2005 reveals that banks offering Internet banking facility had better accounting efficiency ratios and higher returns on equity and returns on assets than non-Internet banks. However, multiple regression results revealed that profitability and offering of Internet banking did not have any significant association.

## Mobile Banking

Mobile banking can be defined as that type of execution of financial services in the course of which–within an electronic procedure–the customer uses mobile devices. It keeps the customer informed and updated about the significant transactions in his account (Bhatt and Khan, 2006). Mobile banking services can be classified as transaction vs. enquiry that include services like fund transfer and bill payment, account statement inquiry, cheque status inquiry, cheque book requests, bill payment alerts, recent transaction history, financial services like share trading, credit/debit alerts, minimum balance alerts, and account balance inquiry. Union Bank became the first to launch mobile banking facility, named U mobile (available only on GSM mobiles), after RBI announced the guidelines for mobile banking in September 2008 (*Business Line*, November 15).

RBI has stipulated further that banks should offer mobile-based banking service only to their own customers, and should have a system of registration before provided mobile based payment services.

## Automated Teller Machines (ATMs)

ATMs have gained prominence as a delivery channel for banking transactions in India. While ATMs facilitate a variety of banking transactions for customers, their main utility has been for cash withdrawal and balance inquiry. Migrating routine transactions to the ATM channel enables banks to free resources while focusing on revenue generation and improving customer satisfaction.

A significant growth comes from the latent potential within the Indian market, which has only 28 ATMs per million people. In countries such as US and Canada, there are nearly 1,300 ATMs per million people while in Mexico it is about 200 ATMs per million. The highest density of ATMs is seen in South Korea where it is about 1,600 ATMs per million. At 55 ATMs per million, China's tally is almost double that of India. Despite rapid growth, India has a long way to go compared to other markets. For example, China has about 80,000 ATMs and the US more than 4,00,000; in India, the count is about 35,000 ATMs (Rao, *2008*).

HSBC set up the first ATM machine in 1987. This led to other banks investing in ATMs. ICICI Bank, which offers its Internet banking services by the name INFINITY, stayed ahead being the first mover and taking advantage of technology opportunity. Among PSBs, SBI is the leader. In Kerala, in 2004, SBI provided ATM facility on a ferryboat (between Ernakulum and Vypeen Island) so that it can be used by customers on ride. It was the world's first facility of such kind. This ATM was designed by NCR Technology and called Persona 70. NCR Technology also has installed an ATM for UTI Bank at Thegu in Sikkim situated at an altitude of 13200ft., making it India's highest ATM. Initially, majority of large banks deployed their own ATMs at various places. ATM machines were very costly, making them unaffordable for small banks. This led to setting up the shared payment network system.

**Shared Payment Network System:** The Indian Banking Association (IBA) took the leadership for its member banks in 1997 to share their ATMs for customers. Called SWADHAN, India's first shared

payment network system (SPNS) was started with the intention of reducing the investment that was required to deploy ATMs in different locations. Swadhan had connected 32 banks? public sector banks, private sector banks, foreign banks, and cooperative banks? with more than 1,000 ATMs (both online and offline) in around 64 cities, and this continued till 2003.

Later, some other ATM sharing networks began operating. Prominent and the largest interbank network among them is the National Financial Switch (NFS), which was launched on August 27, 2004. It was conceived and run by IDRBT, an arm of the Indian central bank RBI and managed by Euronet India Pvt. Ltd. In 2009, it was transferred to National Payments Corporation of India. By December 2009, the network had grown to connect 49,880 ATMs of 37 banks, thereby emerging as the largest network of shared ATMs in the country. Banks ATM Network and Customer Services (BANCS), which was launched on February 25, 2004 with 13 member banks, Cashnet, CashTree, and Multilateral ATM Network Sharing arrangement (MITR) are other interbank networks operating in India.

Commensurate with the branch network, larger banks have deployed more ATMs. Table 1 gives data on the spread of ATMs. One aspect which can be seen easily is the ATM network of new private banks and foreign banks. Percentages of offsite ATMs to total ATMs for private banks and foreign banks were 55.6 and 76 respectively. Percentage of ATMs to total branches for private banks and foreign banks were 150.1 and 377.4 respectively, which were much higher compared to other categories of banks. This shows the focus and intensity of technology in these banks.

According to Boss, Mcranahan, and Mehta (2000), despite introduction of ATMs, consumers did not stop using tellers to the extent banks had hoped. Kamakodi and Khan (2008) describe that, despite the comfort and willingness to use e-banking channels, many feel that human contact is necessary. A study of Kamakodi (2009) found that ATM and debit card facilities have got maximum acceptability among IT based services. Over 90 per cent of respondents expressed happiness about the services they enjoyed with their current banker. Customers were upbeat about technology usage in banking but they also shared a concern that it has increased the 'gap' between clients and banks.

**Biometric ATMs :** Kant (2008) says that the limit in ATM usage is greatly constrained by using the keyboard for entering the password. Biometric technology can be used in breaking the hurdles of keypad usage to help the rural and illiterate people. ATM enhancements with biometric support envisaged by vendors eliminate the need for PIN entry and authenticate customer transactions by thumb impressions to reduce literacy requirements.

Banks in India have started looking at deploying biometric ATMs to reach the unbanked population in rural India. Establishing the identity of a rural depositor through biometrics makes it possible for illiterates or barely literate people to become part of the banking community. When a customer inserts (or swipes) his/her card in a biometric-enabled ATM, he/she is prompted to set his/her finger in the fingerprint scanner. The transaction along with the customer's biometric information is passed on to the switch. The switch verifies the fingerprint with the server, and, if successful, requests the banking application to authorize the transaction. Based on the result, the switch instructs the ATM to complete the transaction (Murli and Jaishankar, 2008).

In 2003, technologists at IIT, Chennai, under the guidance of Prof. Ashok Jhunjunwala, designed a low cost ATM for ICICI Bank, ideal for rural customers. It had fingerprint recognition instead of PIN and was designed to withstand extreme weather conditions and power cuts and was priced only at Rs.30000. Citigroup also plans to introduce biometric ATMs to serve India's poor and illiterate communities. The machines use thumb print identification and voiceover technology to let illiterate customers access their bank accounts. (Katz, 2006). In November 2008, SBI has launched the first biometric ATM at Munnar in Kerala (*Business Line*, November 15).

## RBI and Information Technology

RBI has taken several measures to provide efficient and integrated payment and settlement systems in the country while simultaneously taking steps to mitigate risks. The main thrust is on electronification of payment systems and building appropriate legal and technological infrastructure. Noteworthy measures of RBI towards the proliferation of e-banking in India are as follows.

**Payment and Settlement System:** Bulk and repetitive transactions in India are routed through Electronic Clearing Service (ECS), which is further divided into two categories: ECS Credit (one debit and multiple credits, e.g. salary, dividends) and ECS Debit (one credit and multiple debits, e.g. bill payments, SIPs, etc). According to Chalam and Nageswara (2007), ECS[1] followed by Electronic Fund Transfer[2] (EFT) are quite popular now. A satellite based communication network (INFINET established by RBI) will be initially used to establish systems like EFT, ECS, and e-mail, and the scope will gradually expand to cover all aspects of the payment system.

For one-to-one transactions, India has two main electronic funds settlement systems - RTGS and NEFT. Brief descriptions of both are given below.

**Real Time Gross Settlement System (RTGS) :** RTGS can be defined as continuous (real time) settlement of funds transfers individually on an order-by-order basis (without netting). Real Time means processing of instructions at the time they are received rather than at some later time while Gross Settlement means settlement of funds transfer when instructions are given individually (on an instruction-by-instruction basis). RTGS system, in operation since 2004-5, facilitates faster movement of high value transactions.

Based on the recommendations of an internal group which examined various aspects of payment systems, particularly relating to switching over to electronic modes, a minimum threshold value of Rs.1 lakh was introduced on January 1, 2007. Transactions below this amount are routed through national electronic funds transfer (NEFT). The RTGS system has gained significance in terms of both coverage and value of transactions. The number of RTGS enabled bank branches stood at 55,006 as on March 31, 2009, with the addition of 11,494 branches to the RTGS network during 2008-9. The increased network coverage is reflected in the increase in volume and value settled in RTGS is shown in Figure 1.

[1] An electronic mode of payment / receipt for transactions that are repetitive and periodic in nature. ECS is used by institutions for making bulk payment of amount (ECS Credit) towards distribution of dividend, interest, salary, pension, etc., or for bulk collection of amounts (ECS Debit) towards telephone / electricity / water dues, cess / tax collections, loan instalment repayments, periodic investments in mutual funds, etc.

[2] An electronic exchange or transfer of money from one account to another, either within a single financial institution or across multiple institutions, through computer-based systems.

**National Electronic Funds Transfer (NEFT) System :** NEFT is a nation-wide system that facilitates individuals, firms, and corporates to transfer funds electronically from any bank branch to any individual, firm, or corporate having an account with any other bank branch in the country. It is an electronic fund transfer system that operates on a Deferred Net Settlement (DNS) basis which settles transactions in batches. In DNS, settlement takes place with all transactions received till the particular cut-off time. Currently, NEFT operates in hourly batches - there are eleven settlements from 9 am to 7 pm on weekdays and five settlements from 9 am to 1 pm on Saturdays. Although the NEFT system is a deferred net settlement system, increase in the number of settlements has made it a near real time system.

NEFT, operationalized in November 2005, is gaining importance with increase in both usage and coverage. The banks are providing various e-payment services to their customers using NEFT as backend. Currently, more than 60000 branches of various banks are NEFT- enabled.

On December 20, 2007, the Payment and Settlement Systems Act, 2007 (PSS Act, 2007) received assent of the President and came into force on August 12, 2008. Under this Act, two regulations have been promulgated by RBI, namely, the Board for Regulation and Supervision of Payment and Settlement Systems Regulation, 2008 (BPSS 2008) and the Payment and Settlement Systems Regulations, 2008. Since the PSS Act became effective, it has received applications for authorization from operators/proposed operators of prepaid and other cards, payment gateways, money transfers, mobile payments, ATM network, etc. Authorization has so far been accorded to 21 entities for operating specified payment systems. Banks providing mobile payment services in accordance with the Mobile Banking Transactions in India : Operative Guidelines for Banks issued on October 8, 2008, under Section 18 of the PSS Act are required to obtain approval from RBI. Approval has so far been accorded to 29 banks to provide mobile payment services. All these initiatives have increased the proportion of electronic bank transactions in India, as shown in Figure 2. Table 2 provides a summary of various payment systems from 2005-6 to 2008-9.

**Cheque Truncation System:** In order to enhance the efficiency of the paper based clearing system, RBI has implemented a cheque truncation system (CTS). Truncation is the process of stopping the flow of a physical cheque issued by a drawer at some point enroute to the drawee branch. In its place, an electronic image of the cheque is transmitted to the drawee branch along with relevant information like data on the MICR band, date of presentation, and presenting bank. This effectively eliminates the associated cost of movement of physical cheques, reduces the time required for their collection, and brings elegance to the entire activity of cheque processing. RBI has implemented CTS as a pilot project in the National Capital Region (NCR)with effect from February 1, 2008. After the migration of the entire cheque volume from MICR system to CTS effective July 1, 2009, the traditional MICR-based cheque processing has been discontinued in NCR. Based on the advantages realized by the stakeholders and experienced gained from the pilot roll-out in NCR, RBI has decided to operationalize CTS across the country.

As part of the national roll-out, a grid-based approach is envisioned. The entire cheque volume in the country across numerous locations will be consolidated into five or six grids. Each grid will provide

processing and clearing services to all the centres under its jurisdiction, which could involve an entire state or a group of contiguous states. Chennai has been identified as the next centre for roll-out. The Chennai grid, once fully operational, will not be confined to the city of Chennai, but will cover as many as 17 MICR centres managed / operated by other banks in the states of Karnataka, Kerala, and Tamil Nadu.

**ATM for Financial Inclusion**: RBI has been encouraging bank to use the ATM channel for greater financial inclusion. Table 3 gives details of card based payments. According to RBI, the use of card based payments has risen, but remains negligible compared to conventional cheque based payments. From the figures, we can conclude that credit card transactions outnumber debit card transactions in both volume and value but debit cards have registered a higher growth than credit cards.

**Setup of IDRBT**: In the early 1990s, top management of different banks realized the urgent need for training, research, and development activities in the area of banking technology. In 1994, RBI formed a committee on Technology Upgradation in the Payment Systems. The committee recommended a variety of payment applications which can be implemented with appropriate technology upgradation and development of a reliable communication network. The committee also suggested setting up an information technology institute for the purpose of research and development as well as consultancy in the application of technology to the banking and financial sector. This paved the way for setting up the Institute for Development and Research in Banking Technology (IDRBT) in 1996 in Hyderabad.

IDRBT is one of the certification authorities for digital signature for the banking sector. It used to manage the National Financial Switch (NFS), which was transferred to the National Payments Corporation of India in 2009. IDBRT also manages the Indian Financial Network (INFINET[3]) which provides inter-city and inter-bank connectivity and integration of message transfer facilities within the country with that of the Society for Worldwide Inter-bank Financial Telecommunication (SWIFT[4]). To fulfill the need for a secure and common messaging across intra-bank and inter-bank applications, and to serve the requirements of domestic financial messaging, the Structured Financial Messaging Solution (SFMS) was launched on December 14, 2001, at IDRBT.

**Other Initiatives:** In order to use IT systems efficiently and to provide for business continuity, state-of-the-art data centres are being set up. RBI has also created a comprehensive document that lays down a number of security-related guidelines and strategies for banks to follow in order to offer Internet banking. The guidelines broadly talk about the types of risks associated with Internet banking, technology and security standards, legal issues involved, and regulatory and supervisory concerns. Any bank that wants to offer Internet banking must follow these guidelines and adhere to them as a legal necessity.

[3] INFINET is the communication backbone for the Indian banking and financial sector. All banks, (public sector, private sector, cooperative), and premier financial institutions in the country are eligible to become members of INFINET. Presently, the network is spread across 300 cities in India.

[4] SWIFT operates a worldwide financial messaging network which exchanges messages between banks and other financial institutions. Approximately 9,000 financial institutions in 209 countries and territories exchange an average of over 15 million messages a day.

### *Customer and E-Banking*

With cybercafes and kiosks springing up in cities, access to the Internet is getting easy. With increased access, more customers are switching from traditional banking to e-banking. Among the elite Internet banking users – who belong to the socio-economic class A1 in the top five cities – it has been found that people access their account through the Internet once every week. Similarly, users visit an ATM centre twice a week. The workplace happens to be the most favoured place to access the Internet for banking purposes. The home comes a close second while cybercafes take the third place. ATM in the close vicinity to the office is the most preferred place among users for banking. Those who access an ATM near their office mostly go during the first half of the day, between 9 and 12 noon, but the most preferred time by all users (41 per cent) is between 6 and 9 pm (De and Padmanabhan, 2006). Banks are also leveraging technology to maintain and improve their relationship with its key customers through customer relationship management (CRM) tools. Driven by innovation of technology, CRM has the power to help bankers directly improve customer satisfaction.

## Conclusion

It is clear that e-Banking, used earlier as a strategy for gaining competitive advantage, has now become a necessity for banks' survival. Looking into the benefits for stakeholders, banks have started leveraging technology in an aggressive manner. The Indian government and RBI have provided a conducive platform for banks to offer e-banking services.

At a time when ICT has become a central force for achieving strategic objectives, banks also need to realize that people aspects cannot be ignored. Along with IT, personal touch will be necessary for banks to retain their clients and attract new clients. In a country like India, in spite of the availability of new technology-driven channels, the customer expects a humane relationship with his/her banker. At least for next one or two decades, technology can surely supplement but cannot become a substitute for face-to-face interaction with bankers for major transactions. While aligning the corporate strategy with IT strategy, banks should keep their customers in the core and leverage a mix of channels to tap their current and future customers.

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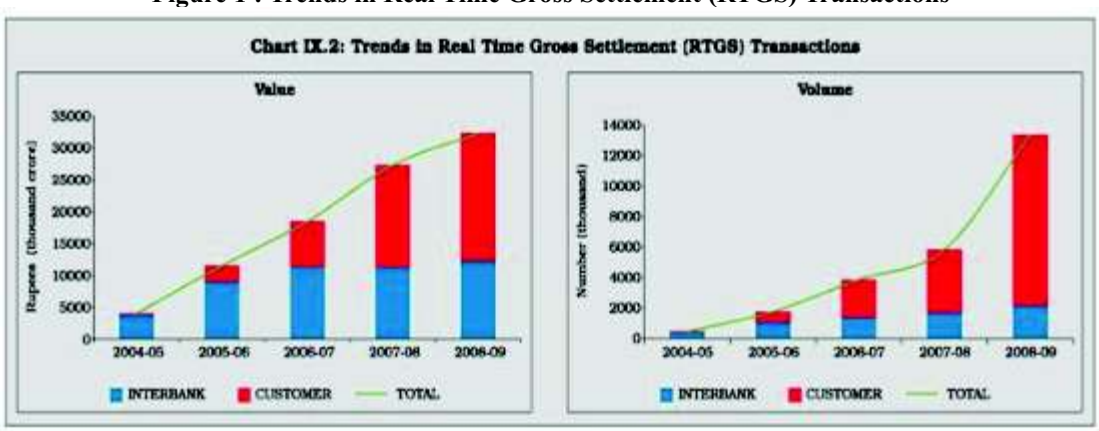
**Table 1: Branches and ATMs of Scheduled Commercial Banks**

(end March 2008)

| Type of the Bank | Branches | | | | | ATMs | | | Per cent of off-site Total ATMs | Per cent ATMs to Branches |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rural | Semi-urban | Urban | Metropolitan | Total | On-site | Off-site | Total | | |
| Scheduled Commercial Banks | 19,557 | 15,055 | 13,726 | 12,794 | 61,132 | 18,486 | 16,303 | 34,789 | 46.9 | 56.9 |
| Public Sector Banks | 18,526 | 12,685 | 11,260 | 10,409 | 52,880 | 12,902 | 8,886 | 21,788 | 40.8 | 41.2 |
| Nationalised Banks | 13,198 | 8,140 | 8,440 | 7,997 | 37,775 | 8,320 | 5,035 | 13,355 | 37.7 | 35.4 |
| Private Sector Banks | 1,031 | 2,368 | 2,417 | 2,159 | 7,975 | 5,315 | 6,652 | 11,967 | 55.6 | 150.1 |
| Old Private Sector Banks | 808 | 1,498 | 1,270 | 874 | 4,450 | 1,436 | 664 | 2,100 | 31.6 | 47.2 |
| Foreign Banks | - | 2 | 49 | 226 | 277 | 269 | 765 | 1,034 | 74.0 | 377.4 |

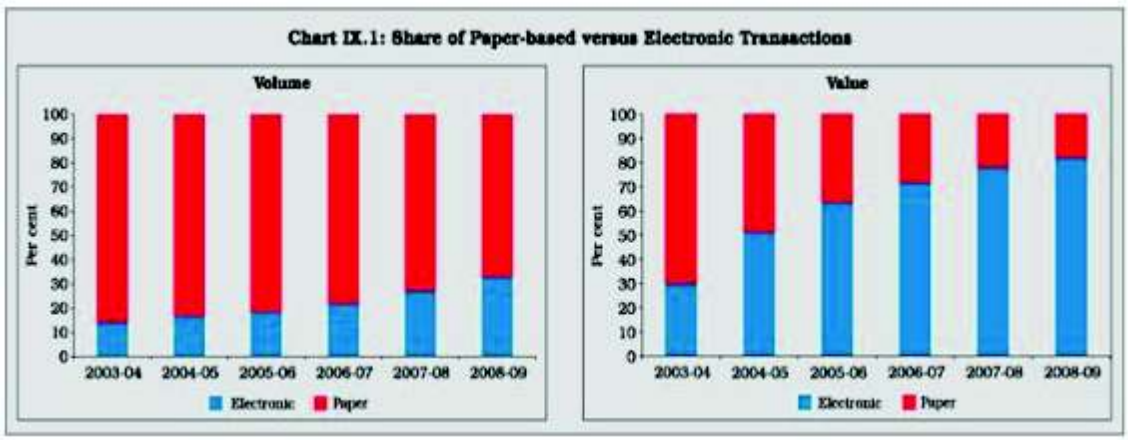
(Source: www.rbi.org.in)

**Figure 1 : Trends in Real Time Gross Settlement (RTGS) Transactions**




Source : http://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=903

**Figure 2 : Share of Paper-based versus Electronic Transactions**




Source : http://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=903

**Table 2 : Payment System Indicators : Annual Turnover**

| Item | | Volume (000s) | | | | Value (Rs Crore) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2005-06 | 2006-07 | 2007-08 | 2008-09 |
| 1. | High Value clearing | 15,924 | 18,730 | 21,919 | 21,848 | 49,81,428 | 50,34,007 | 55,00,018 | 45,50,667 |
| 2. | RTGS | 1,767 | 3,876 | 5,840 | 13,366 | 1,15,40,836 | 1,84,81,155 | 2,73,18,330 | 3,22,79,881 |
| Total) | | 17,691 | 22,606 | 27,759 | 35,214 | 1,65,22,264 | 2,35,15,162 | 3,28,18,348 | 3,68,30,548 |
| Growth (in %) | | | | | | (4.6) | (5.7) | (6.9) | (6.9) |
| 3. | MICR Clearing | 10,15,912 | 11,25,373 | 12,01,045 | 11,40,492 | 44,92,943 | 54,01,429 | 60,28,672 | 58,49,642 |
| 4. | Non-MICR Clearing | 2,54,922 | 2,23,177 | 2,37,600 | 2,33,566 | 18,54,763 | 16,06,990 | 18,67,376 | 20,60,893 |
| 5. | Retail Electronic Clearing | 83,241 | 1,48,997 | 2,18,800 | 2,80,610 | 1,06,598 | 1,86,160 | 9,71,485 | 4,16,419 |
| 6. | Cards | 2,01,772 | 2,29,713 | 3,16,509 | 3,87,215 | 39,783 | 49,533 | 70,506 | 83,903 |
| Total | | 15,55,847 | 17,27,260 | 19,73,954 | 20,41,883 | 64,94,087 | 72,44,112 | 89,38,039 | 84,10,857 |
| | | | | | | (1.8) | (1.8) | (1.9) | (1.6) |

Note: 1. At the end of April 2009, the MICR clearing was available at 66 centres (60 centres during previous year).

2. Electronic clearing comprise ECS, EFT, National/Special Electronic Funds Transfer (NEFT/SEFT)

3.Cards include credit cards and debit cards. 4. Figures in parentheses are ratios to GDP at current market prices.

Source : http://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=903

**Table 3 : Card Based Payments**

| Type | Volume of Transactions (000s) | | | | Value of Transactions(Rs crore) | | | |
|---|---|---|---|---|---|---|---|---|
| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2005-06 | 2006-07 | 2007-08 | 2008-09 |
| Credit Cards | 156,086 | 169,536 | 228,203 | 259,561 | 33,886 | 41,361 | 57,985 | 65,356 |
| | (20.6) | (8.6) | (34.6) | (13.7) | (31.9) | (22.1) | (40.2) | (12.7) |
| Debit Cards | 45,686 | 60,177 | 88,306 | 127,654 | 5,897 | 8,172 | 12,521 | 18,547 |
| | (10.0) | (31.7) | (46.7) | (44.6) | (10.0) | (38.6) | (53.2) | (48.1) |