

CHAPTER – IV

Information Technology in Indian Banks

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INFORMATION TECHNOLOGY IN INDIAN BANKS

4.1 Introduction

The changes after Liberalization and Globalization process instated since 1991 significant impact on the financial system particularly on the banking industry. The fast pace of changes have radically and perceptibly transformed the operational environment of the banking sector. The IT revolution is of entirely changing the way banking business is done and has considerably widened the range of products and increased the expected demand of the bank customers.

With the rapid improvements in electronic technology and availability of higher computer power society has become more sophisticated society than in the older days. We have a better informed and better organized customer who want to be more financially sophisticated, that is, more aware of the value of funds, time and convenience. What does it require? –An efficient banking system that can provide an efficient payment system with lesser time and cost. It has resulted in more competition among the banks and also stimulated more technological developments. The banks are using the electronic technology to meet the ever-increasing competition in banking which has converted the traditional brick and mortar banking into Electronic Banking (E-Banking). We can define the electronic banking as, “delivery of bank’s services to a customer at his office or home by using electronic technology.”

The following developments in the Indian banking system have made it possible to use Electronic Technology to each banking transaction like cash receipts, cash payments, transfer of funds, payments of utility bills and payment of dividends and interests etc.:

- Automated Teller Machines (ATM)
- Electronic Funds Transfer (EFT)
- Electronic Data Interchange (EDI)
- Electronic Clearing System (ECS)

- Shared Payment Network System (SPNS)
- Debit Cards/Credit Cards
- Telephone Banking
- PC Banking
- Internet Banking
- Mobile Banking

Internet banking is the latest and the cheapest technology introduced in the banking industry. It is acknowledged that the Internet has already had a profound effect on delivery of financial services and is likely to bring more radical changes.

Internet banking is the use of Internet as a delivery channel for the banking services, including traditional services, such as electronic bill presentment and payment, which allow the customers to pay and receive the bills on a bank's web site.

There are two ways to offer Internet banking. First, an existing bank with physical offices can establish a web site and offer Internet banking in addition to its traditional delivery channels. Second, a bank may be established as a "branchless", "Internet only", or "virtual" bank.

4.2 Views of Narasimham Committee on Computerization in Indian Banks

- **Views of Narasimham Committee (1991)**

The committee endorsed Rangarajan Committee's (on computerization) view that there is urgent need for a far greater use of computerized systems than at present. The committee emphasized that computerization has to be recognized as an indispensable tool for improvement in customer service, the institution and operation of better control systems, greater efficiency in information technology and the betterment of the work environment for employees. The committee stressed that these are essential requirements for the banks to function effectively and profitably.

- **Views of Narasimhan Committee (1998)**

The committee is of the view that technological upgradation has to be given high priority. The committee observed that the programme of branch computerization has been making slow progress and needs to be speeded up. In further states, that technological upgradation of technology through widespread computerization would enhance the productivity and efficiency of the system, reduce costs and improve customer service. It also presumes that there is no reason to expect that employees will not agree to co-operate or welcome efforts in enhancing the productivity and efficiency of banks.

4.3 Dimensions of Bank Transformation

The term transformation in Indian Banking Industry relates to intermediately stage when the industry is passing from the earlier social banking era to the newly conceived technology based customer-centric and competitive banking. The activities and banks have grown in multi-directional as well as in multi-dimensional manners.

During transformation, all known parameters of the earlier regime continuously change. The current transformation process in the Indian Banking has many aspects. They pertain to:

- Capital Restructuring
- Financial Re-engineering
- Information Technology
- Human Resource Development

IT in banking has been used in four major ways:

- To handle a greatly expanded customers ways
- To reduce substantially to real cost of handing payments
- To liberate the banks from the traditional constraints on time and place
- To introduce new products and services.

Table 4.1: Cost Advantage of E-Delivery Channels in Indian Banks

Cost, if transaction is made through Branch	Rs.50 per Transaction
Cost, if transaction is made through ATM	Rs.15 per Transaction
Cost, if transaction is made through Internet	Rs.4 per Transaction

In ICICI Bank, UTI, HDFC Bank, ABN Amro Bank, only 10 percent of the total transactions take place through the net.

Table 4.2: Impact of Various E-Delivery Channels in Indian Banking Industry (2000-2003).

Name of the Bank	Technology	Customer Base
ICICI Bank	ATMs (125-1750)	2 Million - 5 Million
UTI Bank (647 - 1000)	ATMs	Servicing a base of 1.3 million customers and 90% of total cash withdrawals is through ATMs
ABN Amro Bank	—	92% withdrawals through ATMs 2.5 lakh customers added through ATMs

4.4 Review of Literature

Arora, K. (2003) highlighted the significance of bank transformation. Technology has a definitive role in facilitating transactions in the banking sector and the impact of technology implementation has resulted in the introduction of new products and services by various banks in India.

Brett (1997) studied the changing in old money structure into E-Money. Now days the banks are providing different cards (Smart Card, Credit & Debit Cards) to their customers.

Bakshi, S. (2003) said that good governance is of interest not only to

an individual bank but also to the society in which it operates-the basic objectives being protection of depositors and safeguarding the integrity and soundness of the system.

Chachadi, A. H. (2003) given his views that we have to hone our skills in developing an appropriate culture, which is characterized by teamwork commitment and a problem solving approach.

Clifford (2002) studied the impact of IT on the financial services. The dimensions of banking business are changing in the new economy. In many banks, transformation is managed by IT.

Das, S.C. (2003) said that manpower management is undoubtedly the most important rather the most sensitive and critical areas of management that needs to be handled with utmost care and diligence.

Federick & Phil (2000) analyzed the E-Loyalty. According to them, the unique economics of e-business make customers loyalty more important than ever.

Garg, I.K. (2003) highlighted the challenges faced by the banks in the present transition mode. He also suggested that continuous change must be adopted as a culture and appropriate institutional arrangements must be made to facilitate it.

Jalan, B. (2003) rightly expressed his view in the Bank Economists' Conference (2003), a forward-looking approach to our long-term vision must focus on building human resources in a continuous cycle of competency and development.

Mohan, R. (2003) expressed his views regarding the transformation in Indian Banking that if Indian Banks are to compete globally, the time is opportune for them to institute sound and robust risk management practices.

Robert, T. Parry (2000) said that transformation is taking place amid broader changes in banking sector and suggest three principles to cope up with the transformation. He concluded that countries adopting the suggested principles are benefiting from the increasing globalization of financial services; hence other should follow the road map.

Sankarn, S. (2001) concluded that in the era of transformation banks should go for mergers and acquisitions to improve their size, skills and services. He suggested that Indian Banking has to operate with a global mindset even while fulfilling local banking requirements.

Shapiro (2002) studied the affects of cyberspace on efficiency and productivity of banks. He also analyzed the nature of bank transformation.

Trivedi, A. K. (2003) has rightly said that Indian Banks have always proved beyond doubt their adaptability to change and it would be possible for them to mould themselves into agile and resilient organizations by adopting fine-tuned CRM strategies, operations based on asset-liability and risk management systems, the required technological capabilities and developing human resources to meet the challenges of the paradigm shift.

The review of literature on various aspects of bank transformation concludes that transformation is taking place and IT is playing vital role in bringing this transformation and it is need of the hour to manage this transformation with IT.

4.5 The Indian Scenario

4.5.1 The Entry of Indian banks into Net Banking

Internet banking, both as a medium of delivery of banking services and as a strategic tool for business development, has gained wide acceptance internationally and is fast catching up in India with more and more banks entering the fray. India can be said to be on the threshold of a major banking revolution with net banking having already been unveiled.

The growth potential is, therefore, immense. Further incentives provided by banks would dissuade customers from visiting physical branches, and thus get 'hooked' to the convenience of arm-chair banking. The facility of accessing their accounts from anywhere in the world by using a home computer with Internet connection, is particularly fascinating to Non-Resident Indians and High Networth Individuals having multiple bank accounts.

Costs of banking service through the Internet form a fraction of costs through conventional methods. Rough estimates assume teller cost at Re.1 per

transaction, ATM transaction cost at 45 paise, phone banking at 35 paise, debit cards at 20 paise and Internet banking at 10 paise per transaction. The cost-conscious banks in the country have therefore actively considered use of the Internet as a channel for providing services. Fully computerized banks, with better management of their customer base are in a stronger position to cross-sell their products through this channel.

4.5.2 Products and Services offered

Banks in India are at different stages of the web-enabled banking cycle. Initially, a bank, which is not having a web site, allows its customer to communicate with it through an e-mail address; communication is limited to a small number of branches and offices which have access to this e-mail account. As yet, many scheduled commercial banks in India are still in the first stage of Internet banking operations.

With gradual adoption of Information Technology, the bank puts up a web-site that provides general information on the banks, its location, services available e.g. loan and deposits products, application forms for downloading and e-mail option for enquiries and feedback. It is largely a marketing or advertising tool. For example, Vijaya Bank provides information on its web-site about its NRI and other services. Customers are required to fill in applications on the Net and can later receive loans or other products requested for at their local branch. A few banks provide the customer to enquire into his demat account (securities/shares) holding details, transaction details and status of instructions given by him.

Some of the banks permit customers to interact with them and transact electronically with them. Such services include request for opening of accounts, requisition for cheque books, stop payment of cheques, viewing and printing statements of accounts, movement of funds between accounts within the same bank, querying on status of requests, instructions for opening of Letters of Credit and Bank Guarantees etc. These services are being initiated by banks like ICICI Bank Ltd., HDFC Bank Ltd. Citibank, Global Trust Bank Ltd., Axis Bank Ltd., Bank of Madura Ltd., Federal Bank Ltd. etc.

Some of the more aggressive players in this area such as ICICI Bank Ltd., HDFC Bank Ltd., Axis Bank Ltd., Citibank, Global Trust Bank Ltd. and Bank of Punjab Ltd. offer the facility of receipt, review and payment of bills on-line. These banks have tied up with a number of utility companies. The 'Infinity' service of ICICI Bank Ltd. also allows online real time shopping mall payments to be made by customers. HDFC Bank Ltd. has made e-shopping online and real time with the launch of its payment gateway. It has tied up with a number of portals to offer business-to-consumer (B2C) e-commerce transactions. The first online real time e-commerce credit card transaction in the country was carried out on the Easy3shoppe.com shopping mall, enabled by HDFC Bank Ltd. on a VISA card.

Banks like ICICI Bank Ltd., HDFC Bank Ltd. etc. are thus looking to position themselves as one stop financial shops. These banks have tied up with computer training companies, computer manufacturers, Internet Services Providers and portals for expanding their Net banking services, and widening their customer base. ICICI Bank Ltd. has set up a web based joint venture for on-line distribution of its retail banking products and services on the Internet, in collaboration with Satyam Infoway, a private ISP through a portal named as icicisify.com. The customer base of www.satyamonline.com portal is also available to the bank. Setting up of Internet kiosks and permeation through the cable television route to widen customer base are other priority areas in the agendas of the more aggressive players. Centurion Bank Ltd. has taken up equity stake in the teauction.com portal, which aims to bring together buyers, sellers, registered brokers, suppliers and associations in the tea market and substitute their physical presence at the auctions announced.

Banks providing Internet banking services have been entering into agreements with their customers setting out the terms and conditions of the services. The terms and conditions include information on the access through user-id and secret password, minimum balance and charges, authority to the bank for carrying out transactions performed through the service, liability of the user and the bank, disclosure of personal information for statistical analysis and credit scoring also, non-transferability of the facility, notices and termination, etc.

The race for market supremacy is compelling banks in India to adopt the latest technology on the Internet in a bid to capture new markets and customers. HDFC Bank Ltd. with its 'Freedom- the e-Age Saving Account' Service, Citibank with 'Suvidha' and ICICI Bank Ltd. with its 'Mobile Commerce' service have tied up with cellphone operators to offer Mobile Banking to their customers. Global Trust Bank Ltd. has also announced that it has tied up with cellular operators to launch mobile banking services. Under Mobile Banking services, customers can scan their accounts to seek balance and payments status or instruct banks to issue cheques, pay bills or deliver statements of accounts. It is estimated that cellular phones will have become the premier Internet access device, outselling personal computers. Mobile banking will further minimize the need to visit a bank branch.

4.5.3 The Future Scenario

Compared to banks abroad, Indian banks offering online services still have a long way to go. For online banking to reach a critical mass, there has to be sufficient number of users and the sufficient infrastructure in place. The 'Infinity' product of ICICI Bank Ltd. gets only about 30,000 hits per month, with around 3,000 transactions taking place on the Net per month through this service. Though various security options like line encryption, branch connection encryption, firewalls, digital certificates, automatic sign-offs, random pop-ups and disaster recovery sites are in place or are being looked at, there is as yet no Certification Authority in India offering Public Key Infrastructure which is absolutely necessary for online banking. The customer can only be assured of a secured conduit for its online activities if an authority certifying digital signatures is in place. The communication bandwidth available today in India is also not enough to meet the needs of high priority services like online banking and trading. Banks offering online facilities need to have an effective disaster recovery plan along with comprehensive risk management measures. Banks offering online facilities also need to calculate their downtime losses, because even a few minutes of downtime in a week could mean substantial losses. Some banks even today do not have uninterrupted power supply unit or systems to take care of prolonged power breakdown. Proper encryption of data and effective use of passwords are also

matters that leave a lot to be desired. Systems and processes have to be put in place to ensure that errors do not take place.

Users of Internet Banking Services are required to fill up the application forms online and send a copy of the same by mail or fax to the bank. A contractual agreement is entered into by the customer with the bank for using the Internet banking services. In this way, personal data in the applications forms is being held by the bank providing the service. The contract details are often one-sided, with the bank having the absolute discretion to amend or supplement any of the terms at any time. For these reasons domestic customers for whom other access points such as ATMs, telebanking, personal contact, etc. are available, are often hesitant to use the Internet banking services offered by Indian banks. Internet Banking, as an additional delivery channel, may, therefore, be attractive / appealing as a value added service to domestic customers. Non-resident Indians for whom it is expensive and time consuming to access their bank accounts maintained in India find net banking very convenient and useful.

The Internet is in the public domain whereby geographical boundaries are eliminated. Cyber crimes are therefore difficult to be identified and controlled. In order to promote Internet banking services, it is necessary that the proper legal infrastructure is in place. Government has introduced the Information Technology Bill, which has already been notified in October 2000. Section 72 of the Information Technology Act, 2000 casts an obligation of confidentiality against disclosure of any electronic record, register, correspondence and information, except for certain purposes and violation of this provision is a criminal offence. Notification for appointment of Authorities to certify digital signatures, ensuring confidentiality of data, is likely to be issued in the coming months. Comprehensive enactments like the Electronic Funds Transfer Act in U.K. and data protection rules and regulations in the developed countries are in place abroad to prevent unauthorized access to data, malafide or otherwise, and to protect the individual's rights of privacy. The legal issues are, however, being debated in our country and it is expected that some headway will be made in this respect in the near future.

Notwithstanding the above drawbacks, certain developments taking place at present, and expected to take place in the near future, would create a conducive environment for online banking to flourish. For example, Internet usage is expected to grow with cheaper bandwidth cost. The Department of Telecommunications (DoT) is moving fast to make available additional bandwidth, with the result that Internet access will become much faster in the future. This is expected to give a fillip to Internet banking in India.

The recommendations of the Vasudevan Committee on Technological Upgradation of Banks in India have also been circulated to banks for implementation. In this background, banks are moving in for technological upgradation on a large scale. Internet banking is expected to get a boost from such developments. Reserve Bank of India has taken the initiative for facilitating real time funds transfer through the Real Time Gross Settlement (RTGS) System. Under the RTGS system, transmission, processing and settlements of the instructions will be done on a continuous basis. Gross settlement in a real time mode eliminates credit and liquidity risks. Any member of the system will be able to access it through only one specified gateway in order to ensure rigorous access control measures at the user level. The system will have various levels of security, viz., Access security, 128 bit cryptography, firewall, certification etc. Further, Generic Architecture, both domestic and cross border, aimed at providing inter-connectivity across banks has been accepted for implementation by RBI. Following a reference made this year, in the Monetary and Credit Policy statement of the Governor, banks have been advised to develop domestic generic model in their computerization plans to ensure seamless integration. The abovementioned efforts would enable online banking to become more secure and efficient.

With the process of dematerialisation of shares having gained considerable ground in recent years, banks have assumed the role of depository participants. In addition to customers' deposit accounts, they also maintain demat accounts of their clients. Online trading in equities is being allowed by SEBI. This is another area which banks are keen to get into. HDFC Bank Ltd., has tied up with about 25 equity brokerages for enabling third party transfer of funds and

securities through its business-to-business (B2B) portal, 'e-Net'. Demat account holders with the bank can receive securities directly from the brokers' accounts. The bank has extended its web interface to the software vendors of National Stock Exchange through a tie-up with NSE.IT – the infotech arm of the exchange. The bank functions as the payment bank for enabling funds transfer from its customers' account to brokers' accounts. The bank is also setting up a net broking arm, HDFC Securities, for enabling trading in stocks through the web. The focus on capital market operations through the web is based on the bank's strategy on tapping customers interested in trading in equities through the Internet. Internet banking thus promises to become a popular delivery channel not only for retail banking products but also for online securities trading.

WAP (Wireless Application Protocol) telephony is the merger of mobile telephony with the Internet. It offers two-way connectivity, unlike Mobile Banking where the customer communicates to a mailbox answering machine. Users may surf their accounts, download items and transact a wider range of options through the cell phone screen. WAP may provide the infrastructure for P2P (person to person) or P2M (person to merchant) payments. It would be ideal for transactions that do not need any cash backup, such as online investments. Use of this cutting edge technology could well determine which bank obtains the largest market share in electronic banking. IDBI Bank Ltd. has recently launched its WAP- based mobile phone banking services (offering facilities such as banking enquiry, cheque book request, statements request, details of the bank's products etc).

At present, there are only 2.6 phone connections per 100 Indians, against the world average of 15 connections per 100. The bandwidth capacity available in the country is only 3.2 gigabits per second, which is around 60% of current demand. Demand for bandwidth is growing by 350% a year in India. With the help of the latest technology, Indian networks will be able to handle 40 gigabits of Net traffic per second (as compared to 10 gigabits per second in Malaysia). Companies like Reliance, Bharti Telecom and the Tata Group are investing billions of rupees to build fibre optic lines and telecom infrastructure for data, voice and Internet telephony. The online population has increased from just

500,000 in 1998 to 5 million in 2000. By 2015, the online population is expected to reach 70 million. IT services is a \$1.5 billion industry in India growing at a rate of 55% per annum. Keeping in view all the above developments, Internet banking is likely to grow at a rapid pace and most banks will enter into this area soon. Rapid strides are already being made in banking technology in India and Internet banking is a manifestation of this. Every day sees new tie-ups, innovations and strategies being announced by banks. State Bank of India has recently announced its intention to form an IT subsidiary. A sea change in banking services is on the cards. It would, however, be essential to have in place a proper regulatory, supervisory and legal framework, particularly as regards security of transactions over the Net, for regulators and customers alike to be comfortable with this form of banking.

4.6 Policy Implications and Recommendations

In the liberalized, globalized and highly competitive environment, Indian Banking Industry should manage each and every activity through cost effective IT. PSBs should speed up technology up gradation even in the semi-urban and rural sector branches.

- More awareness should be created regarding the IT in banks.
- More training should be given to the staff in PSBs.
- For improving the share of banks, the low-cost deposited action plans should be prepared for those centers where there is adequate potential for deposit mobilization.
- For those centers where inadequate potential for business development is available, an strategy should be formulated for considering the merger and relocation of branches within the framework of RBI guidance.
- A strategic action plan should be initiated for reducing NPAs through IT.
- In order to involve all members in business development and build team spirit at the branch level, regular staff meeting must be organized at least fortnightly or monthly. In this case, IT can play vital and effective role.
- To create awareness about the management of NPAs, profitability

consciousness, planned business development etc., suitable training programming require to be organized for loss-making branches of e-banks and IT can help to create this type of awareness.

- RBI should stop copying the western banking models and should take special care to understand the local ethos and cultural backdrop. Indian bankers should try to promote innovations and creativity taking into account the local ethos.
- With increasing competition among the banks, to meet customer expectations, banks should offer a broader range of deposits, investments and credit products through diverse distributional channels including ungrounded branches, ATMs, telephone and Internet. For this banks should:
 - Become more customer-centric, offering a wide range of products through multiple e-delivery channels.
 - Pay greater attention to profitability (through IT) including cost reduction and increasing fee-based income.
 - Become proficient in managing assets and liabilities according to risk and return.
 - All these changes require vision, determination and extensive communication across all levels in the organization so that the vision and mission of the banks is communicated and understood down the line.
 - Bank should regularly update themselves with economic and trade related developments.
 - Bank should launch an awareness-building programme for understanding the WTO and various e-delivery channels.
 - Bank should help their customers in formulating strategies for achieving global competitiveness.
- Better and Cheaper access to basic infrastructure requirements such as power, telecommunications i.e. VSAT, leased lines etc.
- Creation of customer awareness and education for technology adoption are imperative.

- The IT Act, 2000 should be implemented in totality to handle legal issues.
- Connecting branches into boutiques catering to the requirements of clients and re-engineering the functions of branch banking using technology and delivery channels.
- Setting up of e-banking group to provide grid principles for risk management of e-banking activities.

4.7 Recommendations of the Working Group on Internet Banking Set up by the RBI

Reserve Bank of India constituted a Working Group to examine different issues relating to i-banking and recommend technology, security, legal standards and operational standards keeping in view the international best practices. The Group was headed by the Chief General Manager-in-Charge of the Department of Information Technology and comprised experts from the fields of banking regulation and supervision, commercial banking, law and technology. The Bank also constituted an Operational Group under its Executive Director comprising officers from different disciplines in the bank, who would guide implementation of the recommendations.

The Working Group, as its terms of reference, was to examine different aspects of Internet banking from regulatory and supervisory perspective and recommend appropriate standards for adoption in India, particularly with reference to the following:

- Risks to the organization and banking system, associated with Internet banking and methods of adopting International best practices for managing such risks.
- Identifying gaps in supervisory and legal framework with reference to the existing banking and financial regulations, IT regulations, tax laws, depositor protection, consumer protection, criminal laws, money laundering and other cross border issues and suggesting improvements in them.

- Identifying international best practices on operational and internal control issues, and suggesting suitable ways for adopting the same in India.
- Recommending minimum technology and security standards, in conformity with international standards and addressing issues like system vulnerability, digital signature, information system audit etc.
- Clearing and settlement arrangement for electronic banking and electronic money transfer; linkages between i-banking and e-commerce.
- Any other matter, which the Working Group may think as of relevance to Internet banking in India.

Under the present regime there is an obligation on banks to maintain secrecy and confidentiality of customer's account. In the Internet banking scenario, the risk of banks not meeting the above obligation is high on account of several factors like customers not being careful about their passwords, PIN and other personal identification details and divulging the same to others, banks' sites being hacked despite all precautions and information accessed by inadvertent finders. Banks offering Internet banking are taking all reasonable security measures like SSL access, 128 bit encryption, firewalls and other net security devices, etc. The Group is of the view that despite all reasonable precautions, banks will be exposed to enhanced risk of liability to customers on account of breach of secrecy, denial of service etc., because of hacking/other technological failures. The banks should, therefore, institute adequate risk control measures to manage such risk.

In Internet banking scenario there is very little scope for the banks to act on stop-payment instructions from the customers. Hence, banks should clearly notify to the customers the timeframe and the circumstances in which any stop-payment instructions could be accepted.

The banks providing Internet banking service and customers availing of the same is currently entering into agreements defining respective rights and liabilities in respect of Internet banking transactions. A standard format/minimum consent requirement to be adopted by banks may be

designed by the Indian Banks' Association, which should capture all essential conditions to be fulfilled by the banks, the customers and relative rights and liabilities arising there from. This will help in standardizing documentation as also develop standard practice among bankers offering Internet banking facility.

The concern that Internet banking transactions may become a conduit for money laundering, has been addressed by the Group. Such transactions are initiated and concluded between designated accounts. Further, the proposed Prevention of Money Laundering Bill 1999 imposes obligation on every banking company to maintain records of transactions for certain prescribed period. The Banking Companies (Period of Preservation of Records) Rules, 1985 also require banks to preserve certain records for a period ranging between 5 to 8 years. The Group is of the view that these legal provisions which are applicable to all banking transactions, whether Internet banking or traditional banking, will adequately take care of this concern and no specific measures for Internet banking is necessary.

4.7.1 Regulatory and Supervisory Issues

All banks, which propose to offer transactional services on the Internet should obtain approval from RBI prior to commencing these services. Bank's application for such permission should indicate its business plan, analysis of cost and benefit, operational arrangements like technology adopted, business partners and third party service providers and systems and control procedures the bank proposes to adopt for managing risks, etc. The bank should also submit a security policy covering recommendations made in chapter-6 of this report and a certificate from an independent auditor that the minimum requirements prescribed there have been met. After the initial approval the banks will be obliged to inform RBI any material changes in the services/products offered by them.

RBI may require banks to periodically obtain certificates from specialist external auditors certifying their security control and procedures. The banks will report to RBI every breach or failure of security systems and procedure and the

latter, at its discretion, may decide to commission special audit/inspection of such banks.

To a large extent the supervisory concerns on Internet banking are the same as those of electronic banking in general. The guidelines issued by RBI on 'Risks and Controls in Computers and Telecommunications' will equally apply to Internet banking. The RBI as supervisor would cover the entire risks associated with electronic banking as a part of its regular inspections of banks and develop the requisite expertise for such inspections. Till such capability is built up, RBI may outsource this function to qualified EDP auditors.

Record maintenance and their availability for inspection and audit is a major supervisory focus. RBI's guidelines on 'Preservation and Record Maintenance' will need to be updated to include risks heightened by banking on the net. The enhancements will include access to electronic record only by authorized officials, regular archiving of data, a sufficiently senior officer to be in charge of archived data with well defined responsibilities, use of proper software platform and tools to prevent unauthorized alteration of archived data, availability of data on-line, etc. If not available on-line, the system should be capable of making available the data for the same financial year within 24 hours and past data within a period of maximum 48 hours.

Banks should develop outsourcing guidelines to manage effectively, risks arising out of third party service providers such as risks of disruption in service, defective services and personnel of service providers gaining intimate knowledge of banks' systems and misutilizing the same, etc. Alternatively, IBA or IDBRT may develop broad guidelines for use of the banking community.

With the increasing popularity of e-commerce, i.e. buying and selling over the Internet, it has become imperative to set up 'Interbank Payment Gateways' for settlement of such transactions. The Group has suggested a protocol for transactions between the customer, the bank and the portal and have recommended a framework for setting up of payment gateways. In their

capacity as regulator of banks and payment systems of the country, the RBI should formulate norms for eligibility of an institution to set up a payment gateway and the eligible institution should seek RBI's approval for setting up the same.

Only institutions who are members of the cheque clearing system in the country may be permitted to participate in Interbank payment gateways for Internet payment. Each gateway must nominate a bank as the clearing bank to settle all transactions. Only direct debits and credits to accounts maintained with the participating banks by parties to an e-commerce transaction may be routed through a payment gateway. Payments effected using credit cards, payments arising out of cross border e-commerce transactions and all intra-bank payments (i.e. transactions involving only one bank) should be excluded for settlement through an inter-bank payment gateway.

Inter-bank payment gateways must have capabilities for both net and gross settlement. All settlement should be intra-day and as far as possible, in real time. It must be obligatory for payment gateways to maintain complete trace of any payment transaction covering such details like date and time of origin of transaction, payee, payer and a unique transaction reference number (TRN).

Connectivity between the gateway and the computer system of the member bank should be achieved using a leased line network (not through Internet) with appropriate data encryption standard. All transactions must be authenticated using user-id and password. Once, the regulatory framework is in place, the transactions should be digitally certified by any licensed certifying agency. SSL/128 bit encryption must be used as minimum level of security. Adequate firewalls and related security measures must be taken to ensure privacy to the participating institutions in a payment gateway. Internationally accepted standards such as ISO8583 must be used for transmitting payment and settlement messages over the network.

The RBI may have a panel of auditors who will be required to certify the security of the entire infrastructure both at the payment gateway end and

the participating institutions end prior to making the facility available for customers use.

The credit risk associated with each payment transaction will be on the payee bank. The legal basis for such transactions and settlement will be the bilateral contracts between the payee and payee's bank, the participating banks and service provider and the banks themselves. The rights and obligations of each party must be clearly stated in the mandate and should be valid in a court of law.

It will be necessary to make customers aware of risks inherent in doing business over the Internet. This requirement will be met by making mandatory disclosures of risks, responsibilities and liabilities to the customers through a disclosure template. The banks should also provide their latest published financial results over the net.