

TECHNOLOGICAL ADOPTION OF BANKS IN INDIA

Indian Banking in Historical Perspective

By S. Ravindran

Abstract: The economy of a country can function smoothly without any hassles if the banking system is not only flexible but also capable of meeting new new challenges posed by the technology. The main aim of the study is to compare the banks based on their adoption of technology in banks. This paper explores the new methods/ factors that affect the adoption of technology in banks. This article attempts to improve the understanding of the banks of the customer attitudes towards the banks' alternative delivery channels (ADC).

INTRODUCTION

The earliest Indian Bank was the Bank of Hindustan set up in 1770. Then in the 19th Century the Presidency Banks (Bank of Calcutta in 1806 Bank of Bombay 1840 and Bank of Madras in 1843) were set up under a charter. Private Banks was allowed in 1900. In 1921 these banks were amalgamated to form the Imperial Bank of India. In 1935 the Reserve Bank of India (RBI) was constituted as the apex Bank. Up to 1949, it was a private ownership bank, then, with the passage of the Banking Regulations Act 1949, it came under government control. State bank of India came into existence and became the Bank of the Government of India in 1955 with RBI taking control of the Imperial Bank of India. State bank of India, in turn took over the shares in the private banks floated in the erstwhile princely states. The objective of State Bank of India Act 1955 was extension of banking facilities on a large scale, more particularly in rural and semiurban areas. In the first phase of nationalization 14 banks were nationalized in 1969.

The independence to the first nationalization period was marked by the consolidation of the banking sector. From 566 banks in 1951, the number came down to 86 in 1971, as weaker banks were emerged with the healthier ones. The department of Banking was set up under the Ministry of Finance. In 1974, priority sector norms were introduced and commercial banks were given five years to meet the norm of 33 or 1/3 percent of credit. The lead bank scheme was formulated for making banks responsible for the credit need to specific districts. The twin structure of rural branches of commercial banks and co-operative banks however was not sufficient to meet the needs of the rural economy and hence Regional Rural Banks were promoted in 1975. For commercial banks also the accent was on branch expansion into the semi-urban and more importantly the rural areas.

INDIAN BANKING: A HISTORICAL PERSPECTIVE

Importance of Banks in the National Economic Development

The banking system which constitutes the core of the financial sector, plays a critical role in transmitting monetary policy impulses to the entire economic system. It is well documented in finance literature that there exists a correlation between financial development and economic growth. Finance is an important and necessary factor for economic development. Though finance is by no means a substitute for real resources, it has a crucial role in the economic development of the country. Its importance lies in the fact that it places at the command of those who have the technical skill and entrepreneurial talent but lack in other means to acquire the capacity missing factors necessary for development. The role of banks is particularly important in less developed economies like India. The segment of capital and money market dealing with lending and borrowing of funds, essentially for short-term purposes, is represented by commercial banking.

Technology in Banks and Its Impact on Operational Efficiency

Commercial banks act as financial intermediaries, i.e. intermediaries of saving and investment. Savings intermediations are a process by which flow of savings of the community is allocated to finance investment in the economy. The importance of commercial banks in the process of economic development has been recognized by all. The commercial banks play an important role in all economies. The role becomes more important in planned or developing economies like India. Banking Industry is the blood vascular system of our economy. It has a positive role to play in the economic development of the country as repositories of people's savings and purveyors of credit, especially as the success of economic development depends on the mobilization of the resources and their investment in an appropriate manner. In a country like India, constitutionally committed to socialistic pattern of society- banks have important role to play i.e. in the reduction of regional disparities, which is an important objective of the economic planning. A very significant measure to reduce regional and state-wise disparities would be to reduce the imbalances in the credit-deposit ratios in the various states. To Quote Bhabha, "Banking is the kingpin of the chariot of economic progress. As such its role in expanding economy of a country like India can neither be under estimated nor overlooked. The success of our plan is depending among other things, on the smooth and satisfactory performance of the role by banking industry of our country. The performance of bank is completely linked to the growth of the economy while the nature and quantum of growth is in turn linked to the availability of bank credit. The structure of the Indian Banking system has undergone during the recent years numerous changes.

Two phases of nationalization (1969 and 1980), introduction of Regional Rural Banks in 1975 and permission to New Private Sector Banks and set up operations since 1993-94 is some of the major changes undergone. The independence to the first nationalization period was marked by the consolidation of the banking sector. From 566 banks in 1951, the number came down to 86 in 1971, as weaker banks were merged with the stronger ones. The department of Banking was set up under the Ministry of Finance. In 1974, priority sector norms were introduced and commercial banks were given five years to meet the norm of 33 or 1/3 percent of credit. The lead bank scheme was formulated for making banks responsible for the credit need to specific districts. The twin structure of rural branches of commercial banks and co-operative banks however was not sufficient to meet the needs of the rural economy and hence Regional Rural Banks were promoted in 1975. For commercial banks also the accent was on branch expansion into the semi-urban and more importantly the rural areas. Priority Sector target was raised to 40% for the commercial banks and the focus of lending changed to rural and agriculture lending with social banking becoming the norm in place of profitable commercial banking. Then in 1980, six more banks were brought into the nationalization fold. The measure bore fruit with rural branches increasing to more than 45 % of the total branch network in 1979 from 22.2 % in 1969. The priority sector lending increased 15 % to 30.6 % during the same period. The banking system occupies an important place in a nation's economy. A banking institution is indispensable in a modern society. It plays a pivotal role in the economic development of a country and forms the core of the money market in an advance country. In India though the money market is still characterized by the existence of both the organized and the unorganized segments, institutions in the organized money market have grown significantly and are playing an increasingly important role. Amongst the institutions in the organized sector of the money market, commercial banks and commercial co-operative banks have been in existence for the past several decades. The Regional Rural Banks came into existence since the middle of seventies. Thus with the phenomenal geographical expansion of the commercial banks and the setting up of the RRBs during the recent past, the organized sector of money market has penetrated into the rural areas as well. Besides the aforesaid institutions which mainly served sources of short term credit to industry, trade, commerce and agriculture, a variety of specialized financial institutions have been set up in the country to cater to the specific needs of industry, agriculture and foreign trade. Among the banking institutions in the organized sector, the commercial banks are the oldest institutions having a wide network of branches, commanding utmost public confidence and having the lion's share in the total banking operations. Subsequently there has been a drift towards state ownership and control. Today 27 banks constitute the strong Public Sector Banks (PSB) group in Indian commercial banking. Up to late sixties, they were mainly engaged in financing organized trade, commerce and industry but since then they are actively participating in financing agriculture, small business and small borrowers also. The commercial banks operating in India fall under a number of sub-categories on the basis of ownership and control of management. Foreign commercial banks are the branches in India of the joint stock banks incorporated abroad. These banks besides financing the foreign trade of the country, undertake banking business within the country as well. The RBI Act has divided the banks into two categories: (i) Scheduled Commercial Banks, and (ii) Non-Scheduled Commercial Banks.

Scheduled Commercial Banks:

According to RBI Act 1934, a scheduled bank is that bank which has been included in the second scheduled of the Reserve Bank of India. To be eligible for this concession a bank must satisfy the following three conditions viz. (i) It

must have a paid up capital and reserves of an aggregate value of at least Rs. 5 lakhs; (ii) It must satisfy the RBI that its affairs are not conducted in a manner detrimental to the interests of its depositors; and (iii) It must be a corporation and not a partnership or a single owner firm. RBI gives them credit and many other facilities. These banks can also get their hundies rediscounted from the RBI. Commercial banks have to keep fixed proportions of their demand deposits and time deposits with the RBI. They have to submit deposits of their business to RBI.

Non-scheduled Commercial Banks:

These are those banks of which the total capital is less than RS.5 lakh. These banks are not included in the second scheduled of the RBI. RBI has no specific control upon these banks. But they have to send details of their business to the RBI every month.

Technology in Banks and Its Impact on Operational Efficiency and Risk Management

Public sector in Indian banking reached its present position in three stages:

- Conversion of the then existing Imperial Bank of India into the SBI in 1955 followed by the establishment of its seven subsidiary banks.
- nationalization of 14 major commercial banks on July 19, 1969.
- nationalization of 6 more commercial banks on April 15, 1980.

One of the New Bank of India was later on merged with PNB. Thus 27 banks constitute public sector in Indian commercial banking. Public Sector Banks includes SBI Subsidiaries of SBI, and 14 Banks Nationalized in 1969 and 6 Banks Nationalized in 1980.

New Private Sector Banks

In accordance with the financial sector reforms adopted in 1991 New Private Sector Banks have been permitted to be set up. According to Narasimhan Committee New Private Sector Banks should be allowed to be established in India. These New Private Sector Banks will complement the overall Financial Sector Reforms. They will provide a financially viable technologically up to date, customer friendly and efficiently competitive financial intermediation.

Information Technology has made the banking services faster, more efficient, and more economical. Its impact can be seen on the efficiency of banks, productivity, profitability, employment, psychology of customers. The Internet is taking banks in the directions other than loans and deposits. With the advent of Information Technology, banking in India will never be the same again.

INDIAN BANKING IN THE REFORMS ERA

Since the beginning of the reforms period in 1991, there have been attempts to adopt a new course of financial and economic development based on the principles of improved quality, greater efficiency and higher productivity. The financial sector reforms, which were introduced from 1991 onwards, were aimed at transforming the credit institutions into organizationally strong, financially viable and operationally efficient units". High regulatory requirements had also taken their toll and most banks were completely in the red. Capital was infused, operating restrictions were relaxed, competition was promoted, but most importantly the profit motive in banking system was brought in. The current structure of the banking system which has succeeded is a product of these external and internal changes. Since 1991, a number of reforms were introduced in the Indian banking system so as to make it internally viable and internationally competitive.

The course of agenda for Indian banks in the reforms era have been as follows:

(i) Banks would have to move away from excessive concentration on asset management and adopt a more general approach of asset liability management, aimed at modifying their liability structure in consonance with the desired asset structure.

(ii) Accord high priority to management of credit risks. With liberalization and globalization, various market risks such as interest rate risk, price risk, liquidity risk, exchange risk etc. are on the rise.

(iii) Banks would have to equip themselves to co-operate in an increasingly deregulated interest rate environment and the freedom given to them in the determination of interest rates must be used judiciously. Too high a lending rate is not necessarily an advantage to banks.

(iv) A significant improvement in customer service by banks can no longer be ignored. Technology will have to play an important role in this.

(v) Finally house-keeping issues within would have to be addressed in an innovative manner.

Technology in Banks and Its Impact on Operational Efficiency

Banking Developments in India Since 1991

As part of the New Economic Policy, 1991 the Government was forced to have a rethinking on the banking sector policies and the government appointed Narasimham Committee to suggest measures to revamp the functioning of the banks. Financial sector reforms were initiated in India in the year 1992 following the report of the Committee on the Financial Systems (CFS). The recommendations of the CFS were framed with the broad objective of consolidating the quantitative progress achieved in Indian financial system after nationalization of the major private sector banks and arresting the qualitative deterioration of services that had accompanied the quantitative growth. As pointed out earlier, the base of the reform measures in the banking sector were the recommendations of the Narasimham Committees I and II. But it is to be mentioned that the government has implemented these recommendations only on a selective basis. Narasimham Committee-I was appointed in 1991. The main recommendations of this Committee Report which was tabled in the Parliament on Dec. 17, 1991 were as follows:

- (1) Phased reduction of Statutory Liquidity Ratio (SLR) to 25% over a 5 years' period.
- (2) Progressive reduction in Cash Reserve Ratio (CRR)
- (3) Phasing out of directed credit programmes and redefinition of priority sector.
- (4) Deregulation of interest rates so as to reflect emerging market conditions.
- (5) Stipulation of minimum capital adequacy ratio of 4 percent to risk weighted assets by March 1993, 8percent by March 1996 and percent by banks having international operations by March 1994.
- (6) Adoption of uniform accounting practices for income recognition, asset classification and provisioning against bad and doubtful debts.
- (7) Imparting transparency to bank balance sheets and making full disclosures (stopping window dressing practices by banks).
- (8) Setting up special tribunals to speed up the process of recovery of loans.
- (9) Setting up Asset Reconstruction Fund (ARF) to take over from banks a portion of their bad and doubtful advances at a discount.
- (10) Restructuring of the banking system so as to have three or four large banks which could become international in character, 8 to 10 national banks and local banks confined to specific regions and RRBs confined to rural areas.

- (11) Setting up one or more rural banking subsidiaries by public sector banks.
- (12) Permitting RRBs to engage in all types of banking business.
- (13) Abolition of branch licensing.
- (14) Liberalizing the policy regarding allowing foreign banks to open offices in India.
- (15) Rationalization of foreign operations of Indian banks.
- (16) Giving freedom to individual banks to recruit officers.
- (17) Inspection by supervisory authorities based essentially on the internal audit and inspection reports.
- (18) Ending the duality of control over banking system by Banking Division and RBI.
- (19) A separate authority for supervision of banks and financial institutions which would be a semi-autonomous body under RBI.
- (20) A revised procedure for selection of Chief Executives and Directors of PSBs.
- (21) Segregation of direct lending functions of IDBI to a separate institution.
- (22) Obtaining resources from the market on competitive terms by DFIs.
- (23) Supervision of merchant banks, mutual funds, leasing companies etc. by separate agency to be set up by RBI and enactment of separate legislation providing appropriate framework and laying down prudential norms for such institutions.

Among the above recommendations, the Central Government has so far implemented only a selected few recommendations. Those recommendations which have been implemented by the Government and their outcomes .

- (i) Deregulation of entry of new private banks (domestic and foreign) in 1992-'93.
- (ii) Liberalization of branch licensing policy to allow more branches according to market needs subject to certain minimum requirements. Deregulation and Liberalization have resulted in increased competition amongst the banks. By 1996, nine domestic and eleven foreign banks were granted licenses after being convinced that the new entrants were well managed, financially viable and technologically strong.
- (iii) Phase-wise deregulation of interest rates of deposits and advances. Interest rates that were previously completely administered by RBI, are now allowed to be administered by the individual banks in respect of term deposits maturity over 1 year and all advances exceeding 2 lakhs.

Impact of the First Generation Reforms (Narasimham Committee Report-I):

- (1) The number of private sector banks has increased marginally. This has resulted in tremendous competition in the industry – **the new generation private sector banks being very aggressive and dynamic and are equipped with most modern technology.**
- (2) The non-interest income of banks in general, particularly the private sector banks has increased remarkably because of the income from allied services like merchant banking, credit cards, Leasing & Hire Purchasing etc.
- (3) The ratio of Non Performing Assets (NPAs) has decreased considerably over the years. In the case of PSBs, it has declined to the level of 16% in 1997-'98 whereas the same is 10% in the case of private sector banks. (These ratios further declined during the second generation reforms).
- (4) The deposits and advances of non-banking financial intermediaries including finance companies, mutual funds and capital market have declined; partly because of the saturation factor.

(5) The then capital adequacy ratio of 8% was not achieved by all PSBs. (Presently all banks including PSBs have achieved the current capital adequacy ratio of 10%, as of 31.03.2004).

(6) The profitability of PSBs has not improved considerably. (During the period of second generation reforms, however, all PSBs have registered considerable improvement in profitability).

(7) Credit-Deposit Ratio declined during post-reforms period. It was as high as 60.6% in 1991-'92 and the same declined to the level of 52.2% in 1993-'94. Thus, in spite of reduction of CRR and SLR, the CDR declined.

(8) The reduction in CRR and SLR, stringent prudential norms and industry recession resulted in the reduction in credit off-take and hence in the CDR ratio. This factor had another consequence viz. huge cash surpluses with the banks.

This prompted banks to invest more in government securities where the capital adequacy norms were not applicable. Further, the difference in interest on advances and government securities also reduced which in turn made such investments more attractive. In short, it may be seen that during the first phase of the reforms, there was no significant quantitative improvements in banking activities. This was because of the fact that the role of the state did not change much. Its role got redefined but not diminished. The genesis of the second generation reforms can be traced to the Indian Economic Survey- 1998-'99. The Survey called for a comprehensive second phase of reforms to avert possible fiscal deficit. The reform measures as suggested by the survey were liberalization of trade in agriculture, a sharp reduction in fiscal deficit and further cuts in interest rates. These measures were expected to help the economy to overcome the effects of a continued global slowdown. The agenda for the second phase of economic reforms were as follows:

- (1) Monetary situation calls for softening of interest rates.
- (2) Review of labour laws and also SSI reservation for export sector; doing away with state monopoly on warehousing, cargo handling.
- (3) Allowing entry of insurance, pension funds for long term funds for infrastructure.
- (4) Use of NBFCs to channel funds to the productive sectors.
- (5) Removal of quantitative curbs on agri-exports and imports.
- (6) Imposing constitutional limits on deficits.
- (7) Use of taxes and prices to further environmental goals.

Reforms during 1998-'99 were based on the recommendations of Narasimham Committee – II on banking sector reforms. The RBI announced a number of decisions on 30th October, 1998. These included the following:

- (i) Introduction in a phased manner risk weight to government approved securities
 - (ii) Risk weight for government guaranteed advances
 - (iii) General provision for standard assets
 - (iv) Higher Capital Adequacy Ratio (or, Capital to Risk Weighted Assets Ratio, CRAR) of 9% (Later this was increased to 10%. Currently it is 10%). Impact of the Second Generation Reforms (Narasimham Committee Report– II)
- (1) Competition in the banking industry became intense. In view of the cut-throat competition, **banks started marketing their products** aggressively in order to maintain and improve their market share. Even PSBs are no exception in this regard, though the private sector banks and foreign banks have been more aggressive in their

approach. Besides, there has been a **paradigm shift of** banks from industrial and corporate credit to retail credit. On the one hand, the economic recession has resulted in reduced credit off-take to corporate, commercial and other business sectors; thus making retail credit a better business proposition for banks. On the other hand such factors like availability huge surplus funds, high disintermediation pressures, relatively safe nature of retail credit portfolio particularly housing finance, rising disposable income of the upper middle class etc. also contributed their share in the above paradigm shift towards retail.

(2) The non-interest income of banks in general has increased substantially. This is primarily because of the huge income from treasury activities especially investments in government securities. The low CRR and SLR ratios and reduced credit off-take to the industrial sector prompted banks to resort to invest their surplus funds to improve their profits.

(3) There has been remarkable improvement in profitability and financial position of all banks, particularly the PSBs. It can be noticed that there has been substantial improvement in respect of asset quality as is evidenced by the constantly lowering NPA figures particularly the PSBs; the exception being the private sector banks. Similarly all PSBs could register higher profit than in the previous years during the last few years. Further, all the PSBs could attain the minimum stipulated Capital Adequacy ratio during the last two years viz. 2003 and 2004.

INDIAN BANKING: ADVENT OF MODERN TECHNOLOGY

In India around 73 percent of the bank branches are located in rural and semi-urban areas. In the country as a whole, **only 10% of the branches of the public sector banks are fully computerized and 22percent are partially computerized.** But on the other hand some new private sector banks are fully computerized & they are launching a gateway to facilitate intra-bank transfer of funds through Internet. They are bringing banking services to the very door step. Especially **HDFC Bank, ICICI Bank and Citibank** are very active on this front and are concentrating on Internet and e-commerce to offer their clientele a whole range of products under one roof. Their net profits are much more than other rival banks.

Some new private sector banks **like IDBI Bank, UTI Bank (Axis Bank), Indusind Bank etc. are fully computerized and they are providing services like ATMs, On-line services etc.** and can compete effectively even with foreign banks. Recently, they have started to penetrate in semi-urban and rural sector of India. Their profits and branch network are showing an increasing trend.

Technology in Banks and Its Impact on Operational Efficiency and Risk Management Most public sector banks have hundreds of branches without computers and inter bank connectivity is a distant possibility. But some have started moving in this direction. SBI plans to invest \$200 millions on technology over the next two years. Other public sector banks too have started spending on Information Technology. It is estimated that each public sector bank will spend about \$50 million over the next five years. But these are the plans, and no public sector bank seems to be in a position right now to make a serious foray into internet banking. The gap in the productivity, profitability and customers psychology of internet using banks, fully computerized and partially computerized banks is widening. New Private Sector Banks have leveraged the internet effectively in taking away the customers from public sector banks and significantly increased their revenue potential. Internet banking is just one manifestation technology capabilities of these banks. Most companies have transferred or are in the process of transferring their payrolls to the new private sector banks or foreign banks in big cities. Even otherwise, the minimum deposit requirements of these banks match that of new private sector banks, public sector banks and with their, added service levels, are an automatic choice of customers. The different segments do not seem to be operating at the same levels of efficiency and profitability because of some built-in structural characteristics of individual banks. By the very nature of ownership, the constraints faced by the public sector banks have been large, generating the problem of a level playing field. In terms of banking skills, however, there may not be significant differences among different bank groups, but in terms of general functional styles and environment and the ability to adopt quickly to emerging situations, public sector banks may not have the type of flexibility that is possessed by Indian private sector banks and foreign banks operating in India. In fact, in the face of the new competitive pressures inherent rigidities in public sector banks to enhance their overall efficiency pose serious challenges. With the development of information technology, the world has become a global village and it has brought a revolution in the banking industry. The banks appear to be on fast track for IT based products and services. Deregulation and liberalization in the financial sector have stimulated financial innovations. Breath taking developments in the technology of telecommunications and electronic data processing have further accelerated these changes. Technology has become the fuel for rapid change. IT is no longer considered as mere transaction processing

or confined to management information system. In its wider definition, it implies the integration of information system with communication technology and of innovative applications to product manufacturing, design and control. IT has brought about fundamental changes in the banking industry and has radically altered the traditional ways of doing banking business. Increasingly the customers in retail sector are doing business with their banks from the comfortable confines of their homes or offices. Customers can view the accounts, get account statements, transfer funds, purchase drafts by just making a few key punches. Availability of ATMs and plastic cards to a large extent avoid customers going to branch premises. Cards with an embedded micro-processor chip (smart cards) have added a new dimension to this scenario. EDI is another development that has made its impact in the banking industry. In banking industry, IT finds its use in five key areas:

- (i) convenience in product delivery access
- (ii) managing productivity access
- (iii) product design,
- (iv) adapting to market and customer needs and,
- (v) access to customer market.

The first serious effort of computerization and mechanization in the Indian banking industry was in 1983-84. But the process of computerization in Indian banking industry in India, particularly in PSBs, has been very slow. As a culmination of the implementation of the recommendations of (Saraf Committee, Shere Committee and Vasudevan Committee), today the transactions of all large branches of banks have been fully computerized and banks have moved in the direction of inter-branch and inter- Indian Banking. Electronic Funds transfer and delivery versus payment system have been introduced. Bank customers are becoming very demanding and it is the extensive use of IT that will enable banks to satisfy their requirements. The four major objectives of computerization in banking are:

- (i) improvement in customer service
- (ii) better house-keeping
- (iii) faster decision making
- (iv) increase in productivity and profitability.

With the enactment of the IT Act on Oct.8, 2000, India had reached another significant mile stone on the information super highway .The Act provide legal sanctity. To electronic commerce and lays down penalties for hacking and other crime. India will become the. 12th country in the world to have an IT bill in place for recognizing digital signature and facilitating e-commerce. IT is also helping in cutting costs by providing cheaper ways of delivering products to customers. Banks are moving into the primary services of helping their customers buy things like automobiles, real estates, in all these areas, IT has been enormous help. The younger age group customers are much more amenable to using electronic delivery channels rather than visiting physical branches. Banks have been cautious in launching new services using IT. The virtual financial services can be largely categorized as follows:

Automated Teller Machines

- Cash withdrawals
- Fast cash
- Details of most recent balance of account
- Mini-statement
- Statement ordering facility
- Deposit facility

- Payments to third parties
- Balance enquiry
- Statement ordering
- Funds transfer (payment) to third parties
- Funds transfer between customers different accounts
- Order traveler's cheques and other financial instruments.
- Cash withdrawal
- Cash / Cheque deposit
- Sale of the more complex types of financial services such as life insurance mortgages and pensions.
- As a replacement for all types of magnetic stripes cards
- ATMcards
- Debit cards
- Charge cards
- Credit cards
- One smart card to carry out all these functions
- One smart card can contain the functionality of several different types of cards issued by different banks on running of different types of networks.

Internet Banking

The latest wave in IT internet banking. It is become more obvious that the internet has unleashed a revolution that is impacting every sphere of life. Internet is an interconnection of computer communication networks spanning the entire global, crossing all geographical boundaries. Touching lifestyles in every spear the net has redefined methods of communication, work, study, education interaction, health, trade and commerce. The net is changing everything from the way we conduct commerce, to the way we distribute information. Beginning an interactive two-way medium, the net, through innumerable websites, enables participation by individual in B2B and B2C commerce, visit to shopping malls, book-stores entertainment sites, and so on.

RESEARCH METHODOLOGY

The key intention of this paper is to evaluate those factors that manipulate the nature of customers towards **INTERNET banking** and their growing tendency towards the online financial institutions. A survey instrument in the form of questionnaire was developed through data collected from previous studies on acceptance of **net banking**. During the interviews we sought general information from our constituents about internet banking and asked them to discuss the reasons for undertaking net banking and to highlight net banking development challenges. We also asked them to discuss the issues relevant to the future of the initiative. The questionnaires were based on customers' intention to adopt net banking. E- Banking refers to the use of technology which allows customers to access banking services electronically whether is to pay bills, transfer funds, view accounts or to obtain information and advices. It refers to the electronic services that are made available to the customer through phone, personal computers, television and the internet. Technology in banking has been used in four major ways.

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

The following types of IT applications find use in the banking Industry.

Electronic Transfer of Funds

Technology in Banks and Its Impact on Operational Efficiency and Risk Management For years, banks have been effecting inter-city transfer of money for their customers through demand drafts, mail transfer and telegraphic transfers. As each of these modes imposes some limitations, the RBI devised an EFT system to facilitate speediest transfer of funds electronically.

EFT facilitates transfer of funds from the bank accounts of one customer to the bank account of another customer. In this system, the sender and the receiver of funds may be located in different cities and may even bank with the different banks. Funds transfer within the same city is also permitted. The scheme has been in operation since Feb. 7, 1996. The account holders having saving/current/cash credit with the bank can use the EFT facility presently available between Mumbai, Calcutta, New Delhi and Chennai. The upper limit for individual EFT transaction is Rs. 5,00,000 (Rs. five lakh only) and for whole Rupee only (Paisa not allowed). All the 27 public sector banks are the participating banks under the EFT system.

Benefits of EFT:

- Fast: funds are transferred within 24 hours. Delays and paper work are avoided.
- Safe: Frauds in processing paper instruments is avoided.
- Secure: -Facilitates funds transfer from account to account with built in security measures. Control practices, Computerization of control records and detailed procedural guidelines make the system absolutely secure.
- Hassle free: Beneficiary need not go to the bank. Amount is credit to his bank account directly.

Electronic Clearing Service (ECS):

- Electronic Credit Clearing
- Electronic Debit Clearing

ECS Credit Clearing

It is a simple, reliable and cost effective solution for bulk and repetitive payment transactions like salary, pension, interest, commission, dividend etc; by public or Technology in Banks and Its Impact on Operational Efficiency and Risk Management private companies and Govt. Depts. through banks. Under the said system, Companies who have to make bulk payments to a large number of beneficiaries prepare the credit instructions on the magnetic media and submit the same to RBI through their bankers. RBI processes the data arrive, at inter- bank settlement and provide bank and branch wise reports containing the details of payments to facilitate fast payment to the beneficiaries. This scheme was introduced in Chennai and Mumbai in April 1995. But, at present ECS it is available in 46 centers.⁵

ECS Debit Clearing:

It was introduced in March 1996 by RBI direct debit are:

- Telephone and electricity bills.

- Loan installments and insurance premium.
- School, college and club membership fees.
- Credit cards dues.
- Water taxes, property taxes and other regular payments, to your bank account.

Advantages of ECS to Consumers:

- Payment on due date.
- No more "loss in transit"
- No fraudulent encashment.
- Effortless receipt.
- No more correspondence with the companies.
- No hassle of standing in long queues for payments.
- No more disconnection of telephone/electricity line.
- Accounts statement/pass book will show the source of credit and debit.
- Eliminates postal loss and delays as well as paper work and lengthy procedures.
- Saves cost on stationary, printing and postage.
- No fraudulent encashment.
- Immediate receipt and payment of dues. Automatic reconciliation
- Appreciation from investors/customers.

Tele-banking

In tele-banking, by using automatic voice recorder for simple queries and transactions and manned phone terminals for complicated queries and transactions, the customer can actually do entire non-cash related banking on telephone.

Automatic Teller Machines (ATMs):

ATM is a device that allows customers who have an ATM card to perform routine banking transactions without interacting with a human teller. ATMs are currently becoming popular in India that enables the customers to withdraw their money 24 hours a day, 7 days in a week. The simplest ATM allows a customer to withdraw cash up to specified amount by operating the machine via a magnetic card to a host computer. Updating of operations can be either off-line or on-line. In addition to cash withdrawals, ATMs can handle deposits and enquiries, arrange loans and insurance, arrange the buying and selling of stocks and advice customers on different savings and investment schemes. Terminals can be special task terminals such as cash deposit terminal or statement printer terminal or full function terminals which can perform all the tasks. An ATM is operated through the customer's magnetic card. A personal identification code allotted to a customer is magnetically identified by the ATM. When this identity is established, he is allowed to carry out the operations. Three tracks are used in transaction processing:

- (i) Track 1 for account code any bank code
- (ii) Track 2 for credit card (shop centers),
- (iii) Track 3 for debit cards (purchaser/ATM card).

In the case of cash deposits, ATMs can issue a receipt to the customer acknowledgement receipt of the cash. Cash withdrawals can be made only in specified denominations. An ATM could handle as many 5,000 cash transactions without Technology in Banks and Its Impact on Operational Efficiency and Risk Management needing replenishment of notes or journal paper. Security feature in the form of encryption of the customer's personal identification number can be built in.

Credit Cards and Debit Cards

The customer need not carry any cash and is empowered to spend wherever and whenever he wants with his credit card within the fixed limits prescribed by his bank. Debit and unlike credit card which is a post paid card is a prepaid card with same stored value. Every time a person uses the card, the merchant who in turn can get the money transferred to this account from the banks of the buyer, debits an exact amount of purchase from the card.

To get a debit card, an individual opens an account with the issuing bank which gives him a debit card along with a personal identification number (PIN). When he makes a purchase, he enters this number on the shop's pin pad. When the card is swiped through the electronic terminal, it dials the acquiring bank system either master card or VISA that validates the PIN and finds out from the issuing bank whether to accept or decline the transaction. The customer can never overspend because the system will reject any transaction that exceeds the balance in his account and the bank will never face a default because the amount spent is debited immediately from the customers account. Debit card limitation is that currently only some 3000-4000 shops country wide accepts it. Also a person can't operate it in case the telephone lines are down. Currently City bank and Times bank have launched debit cards and many more banks are talking to visa and master card to launch their own cards. An investigation into the adoption of information security technology by banking organizations is conducted using a mixed methods approach that combines both quantitative and qualitative analyses techniques. A theoretically-based security technology adoption model is proposed based on review and meta-analysis of relevant literature. The proposed research model posits that the perceived compatibility of organizational security requirements with security technology characteristics positively affects security technology adoption and that perceived complexity, as determined by organizational security capabilities and security technology characteristics, negatively affects security technology adoption. The model provides a basis for the development of hypotheses that are statistically tested using data collected via survey. To supplement the analyses, a single case study of a large banking organization's information security technology adoption process is also conducted to examine how banking organizations make decisions to adopt information security technologies. Results from the quantitative analysis of data collected via the survey are triangulated with findings from the qualitative case study to identify a number of factors affecting the phenomena of information security technology adoption in banks.

Enabling "less-cash"

While cash is still a dominant force in the payments industry, it has been the endeavor of the entire industry to move customers from using cash to electronic modes of payment. The proliferation of mobile devices has also dramatically changed the ways in which consumers expect the delivery of payment services. Many banks have introduced new payment products with different features for customer convenience as well as internal operational efficiency. While debit cards and credit cards have been in circulation for a very long time, the focus is on making them more secure and reliable through chips or even contact-less cards. Steps are also being taken to ensure that these cards are not misused on the internet by imposing separate limits and card profiles for on-line transactions. Changing consumer expectations, along with the push for financial inclusion, has resulted in a focus on mobile payments. While IMPS has been received well by customers and volumes grow month-on-month, technologies to promote payments even on non-smart phones will be the frontier to breach so that the unbanked population can leverage the true strength and reach of mobile devices.

Furthermore on the operational front, banks are attempting to consolidate and integrate channel infrastructure with help of payments hub to have better visibility on customer payments. Innovations and adoption of mobile and contactless payments, along with focused risk and compliance measures to provide the customers a risk-free and secured transaction are key focus areas. Some banks are also attempting to use analytics to detect Empowering employees Talent management, including a focus on training, knowledge dissemination, knowledge sharing and raising security awareness levels among a large workforce is a key priority for all banks.

CONCLUSION

Technologies such as learning management systems that allow large numbers of employees to be trained using a uniform curriculum in a distributed fashion is a key area of focus. Public sector banks will begin to use these systems to cater to a large number of employees and a considerable geographical spread. Private sector and foreign banks will also need to invest in e-learning platform to ensure that they are able to quickly disseminate knowledge of changes in products, processes, pricing and compliance to their employees.

There have been significant changes in the payments industry in the past decade and technology has played a vital role in its progress. While cash still dominates the payments industry, the entire industry is focusing their energy to move customers from using cash to an electronic mode of payment. Banks have been introducing new products with varied features for customer convenience as well as internal operational efficiency. The industry has seen technological changes such as electronic funds transfer, secured card transactions and mobile payments. However, the biggest challenge faced by banks is the adoption and usage of new age technologies.

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