CHAPTER III

IMPACT OF INFORMATION TECHNOLOGY ON BANKING SECTOR IN INDIA
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Summary

References
3.1 **INTRODUCTION:**

The past few years have witnessed a phenomenal advancement in computers and telecommunication technologies and their fusion has led to data communication networks. This has largely changed the banker's strategy towards the technology absorption.

Processing and execution of payment instructions is one of the statutory obligations of the banks. Conventionally, paper-based instruments like cheques, drafts, dividend and interest warrants, refund orders, gift cheques, travelers cheques, etc., have been the modes of settling payment transactions. However the use of computers and communications has now changed the whole mechanism of funds transfer and the settlement process into the fast and automated EFT systems. An electronic funds transfer differs from the conventional transfer in that the information is processed and transmitted electronically.

3.2 **INTRODUCTION OF INFORMATION TECHNOLOGY IN BANKING** (1)

The extent of application of information technology which emerged as a fusion of computers and telecommunications in the 1990s has greatly transformed the banking operations. The use of computers and telecommunication technology are the main base around which most of the banks are today building their banking services and operations.

There were the two successive committees on computerization (Rangarajan Committee in the year 1983 & 1988) that set the tone for the computerization in India. The second committee set up in 1989 paved the way for an integrated use of telecommunications and computers for applying fully the technological breakthroughs to the banking operations.

MICR technology for speedy clearance of cheques in the four metropolitan cities was a major step towards the automated clearing houses. On the communication front, Banknet and Society for Worldwide Inter-bank Financial Telecommunications (SWIFT) for transmission of messages were commissioned in India in the year 1991. Electronic Funds Transfer (EFT) system now renamed as National Electronic Funds Transfer (NEFT) System, Electronic Clearing System (ECS), and Real Time Gross Settlement (RTGS) systems have also been introduced in all major cities in India.
The foreign banks in India have been more aggressive and have also started their operations with latest technology. A major turning point has been the birth of the fourth generation computer systems. Coupled with this was the vast improvement in the telecommunication technology and the concepts of local area network (LAN) and wide area network (WAN) of computer systems. Now information technology is helping the banks to cross the geographical barriers and take banking to the doorstep of the customers.

**BANK COMPUTERISATION**

The concept of Bank Computerization practically started after 1980-81 and more precisely gained pace in the year 1983-84, after setting up a committee in the year 1983 under the chairmanship of the then Deputy Governor of RBI, Dr. C. Rangarajan. This Committee was set up to study the possibilities and stages involved in bank computerization and to prepare guidelines for the same. The report submitted by the committee in the year 1984 was known as First Rangarajan Committee Report on bank mechanization.

Another Committee was constituted in 1988 under the chairmanship of Dr. C. Rangarajan to draw up a perspective plan on computerization of banks for a five year period 1990-94.

**Need for Computerization**

The four major objectives of computerization in banking are to improve:

(a) Customer service  
(b) housekeeping  
(c) Decision-making  
(d) productivity and profitability.

Computers have a vital role to play wherever there is a huge volume of transactions and the work needs completion within a specified period. Consumers today are becoming more discerning and demanding. There is a price on their time and therefore, when they visit a branch for a deposit or a cheque encashment, they are looking for a quick settlement of their transactions. Thus, the advantages flowing from computerization are many and most people working in the banking industry recognize it. The main objectives of computerization at the branch level should be to improve customer service, quality of housekeeping and generation of data for better management control. At the regional and head office levels, the purpose of
computerization should be to store, analyze and retrieve data received from branches, generating information speedily, thereby strengthening the internal control over branches for policy formulation.

- **Stand-alone Computer System**

The stand-alone computer system is normally the initial stage of computerization at a bank. The single user computer system is a small system, which as its name implies, is used by only one person at a time. Stand-alone systems are best suited for the decision-making process, which involves processing and analysis of data. The managers, executives who are responsible for making managerial decisions benefit from such systems. The stand-alone systems cannot be used in a multi-user environment, but these systems can be easily connected to the existing multi-user systems to access corporate database and other shared information and resources. Normally in such cases a stand-alone system is called a workstation or a node. Today's stand-alone systems are also capable of handling multimedia, high-quality graphics, fax messages, etc.

- **Multi-user Systems**

The multi-user systems, as their names signify, are computers on which several people can work at the same time. Mini computers, Main Frame Computers, Microcomputers and the more powerful Super Computers all fall under this category.

In such a system computers are based on the centralized processing concept. All information is kept and processed at the main central machines and various terminals are attached to the main computer. The main computer can store a huge amount of information and possesses high-processing speeds enabling a large number of users to be connected to the main central computer. These systems work on a time-sharing basis and are well suited for the development of online applications. Most of the banking systems are developed using the centralized computing concept.

- **Branch - level Computerization**

The emphasis on branch-level computerization is for two important reasons. First, customer interface is at the maximum at the branch level. Increased use of computers and advanced technology can lead to reductions in waiting time, accuracy in reporting statement of accounts and expeditious transfer of funds. All these lead to improved customer service. Second, the emphasis on online transactions processing at the branch level is because only if the data is initially captured in the machines, further
processing becomes speedier and easier.

Computerization at the branch level can be used to:

a. Provide better and speedy customer service
b. Improve housekeeping services
c. Analyze the branch-level data for decision making
d. Generation of various reports.

The terminals or the PCs are connected together with a single powerful PC acting as a server. Various productivity tools are utilized to analyze the branch-level data to make branch-level policy decisions. Security measures play an important role in branch-level computerization because of online banking applications. Most of the security features are in-built in the operating system.

- **Total Branch Automation**

With total branch computerization, all the customer and business transactions are done with the help of computers. This is a real time online banking. Whenever a transaction is entered through a terminal, the transaction is recorded. Then it is verified and authenticated and all corresponding updates are reflected instantly. The activities (independent modules) are interlinked to form an integrated system such that changes are effected without a time lag. Various security controls are enforced to ensure data integrity and security. Various outputs such as ledger extracts, passbooks, vouchers, statements of accounts of customers, etc., are generated online. By using total branch computerization, it is possible to provide the 'single window' transactions concept. That means a customer can approach any counter for completing all his or her transactions, but the system should be capable of shifting from a single window to a partial window and or universal window transactions depending upon the customers' convenience and branch needs. EFT (Electronic Fund Transfer) can be used to facilitate the automatic transmission and processing of messages and funds from one branch bank to another branch bank. EFT at points of sale terminals allows transfer of funds electronically and debit and credit the respective accounts. EFT system can be integrated with an existing online system to automate and speed up the fund transfer process. Off-site ATMs are also linked to the branch system to enable the customer to bank anytime/anywhere. Software and hardware requirements depend upon the size of the branch.
• **Computerization at Regional / Circle / Zonal Office**

   RO / ZO acts in between branches and the head office. They exercise effective control over the functioning of the branches including collection of data from them and transmitting the same to the head office after amalgamation. The most common tasks performed by the regional office/zonal office are : a) branch profile, (b) inter-branch reconciliation, (c) credit monitoring, (d) personnel data management, etc.

• **Computerization at Head Office Level:**

   The head office of a bank is responsible for bank-level planning, and control functions, policy decisions. The head office activities are divided into different functional areas like :
   a. Operations,
   b. Planning,
   c. Personnel,
   d. International business,
   e. Services, etc.

   The computerization at various functional areas may include application areas :
   1. Personnel management and administrative support
   2. Funds management
   3. Investment portfolio management
   4. Branch profiles
   5. Credit information system, etc.

   The information generated from various functional areas is important for the top management to make various strategic decisions.

**3.3 TECHNOLOGICAL REVOLUTION IN THE BANKING SECTOR**

Information and Communication Technology (ICT) has changed the working of banks and other financial institutions worldwide. The major breakthrough started with the use of Advanced Ledger Posting Machines (ALPM) in 1980s. The massive computerization started at the branch level with the focus on automation of transactions. This reduced errors in calculations and transactions. Customers started getting error free services and were supplied with printed account statements. In late 1980s, banks focused on Total Branch Automation (TBA) and automation of both
the front-end and back-end operations started within the same branch. Total Branch Automation means total automation of a particular branch with its own database. Mechanised cheques processing systems have been established, which uses a Magnetic Ink Character Reader (MICR) technology. After the entry of new private sector banks and with the advent of internet, banks opted for a different model having a single centralized database instead of having multiple databases for all their branches. Decentralised networks have their own set of problems in terms of cost and management. Internet made it easy to share the databases and maintain a centralised database at a low cost. Internet has provided a paradigm shift in the working of banks. Internet is a network of networks, provides free exchange of information. Internet facilitated the World Wide Web (WWW), where banks can create their own web pages, and customers can access these web pages through the web browsers by shifting at home. This kicked off online banking way back in 1996, while the usage increased only after 1999 due to lower ISP online charges, increased PC penetration and technology stabilisation. Internet has thus ushered the concept of anytime and anywhere banking. Through online banking, customers could get their account information, bills could be paid online through the electronic bill payment service, online requests, i.e. stop payment of cheque, cheque book replenishment, demand draft, opening of fixed deposit account, etc. The other significant developments include the evolution of the ATM channel, debit cards, mobile banking and telephone banking through which the banking facilities are made available to customers on a 24 X 7 basis across the world. Establishment of the INFINET in 1999 resulted in the introduction of Real Time Gross Settlement (RTGS) system. It not only resulted in compliances with the core principles of systematically important payment systems of the Bank for International Settlements (BIS), but has also provided the way for risk free, credit push-based fund transfers settled on a real time basis. The facility for inter-bank funds settlement through RTGS is available today across more than 23,700 branches of banks spanning more than 500 centers in the country.

Data ware housing is a new paradigm specifically intended to provide vital strategic information. Strategic information is not meant for running the day-to-day operations of the business. It is not intended to settle a claim, issue of cheques book, or post a withdrawal from a bank account. Management needs strategic information
for continued health and survival of the bank. Strategic information is needed to take strategic decisions i.e. where to open a new branch, which product lines to be expanded and which market is to be strengthened. Data warehousing is the solution for providing strategic information. The data warehouse is an informational environment that provides an integrated and total view of the bank, makes the banks current and historical information easily available for decision-making, which makes decision-support transactions possible without hindering operational systems. After setting up the data warehouse, the challenge before banks is to discover the process that unearths patterns and trends in the data, which previously were unknown. Data mining helps the user to predict the future.

Intense competition has forced many banks to pay greater attention to retain customers and winning new ones. Customer focus has become the watchword. Concentration on customer experience and customer intimacy has become the key to better customer service. More and more banks are embracing customer relationship management (CRM) systems. Along with other CRM solutions, data mining can also provide vital information about the customer for better relationship management.

Information is the life blood for the banks in mitigating and managing risks. Banks are setting up knowledge management system (KMS) using ICT. Knowledge management is a systematic process for capturing, integrating, organising and communicating knowledge accumulated by the banks. It is a vehicle to share corporate knowledge so that the employees may be more effective and be productive in their work. A KMS must store all the knowledge in a knowledge repository, sometimes called a knowledge warehouse. A knowledge warehouse holds unstructured information; therefore, a knowledge management framework must have tools for searching and retrieving unstructured information. As a part of the KMS, banks have set up their own intranets and extranets, which are a boon to both the employees and customers, spread over wide geographic locations.

> TECHNOLOGICAL REVOLUTION IN COMMERCIAL BANKS:

The banks faced with higher operating costs in recent years have increasingly turned toward automation and electronic networks to replace labour-based production system, especially for taking deposits, dispensing payments, and making
credit available eg. ATM machines; which gives customers 24 hours access to their deposit accounts; point of sale (POS) terminals in stores and shopping centers that replace paper-based way of transactions around the globe.

Thus, banking is becoming more of a capital-intensive, fixed-cost industry and less of a labour-intensive, variable cost industry. Many experts believe that traditional brick and mortar bank building and face to face meetings between bankers and their customers will eventually become relics of the past, replaced by electronic communication. Service production and service delivery will be fully automated. Such steps will significantly lower inter-face between the banker & the customer.

Reserve bank of India has played an important role in implementation of information technology in banking sector. Dr. Rangarajan committee had drawn up in 1983-84 plans for computerization and mechanization in the banking industry and looked into the modalities of drawing up a phased plan for mechanization for the banking industry covering the period 1985-1989. The committee in its report in 1984 recommended the introduction of computerization and mechanization at the branch, Regional office or Zonal office and Head office levels of banks. Nowadays nearly all nationalized banks have implemented IT based solutions for their day to day transactions. According to the RBI policy, nearly all commercial banks have already implemented the step by step solutions for doing computerised transactions. Public sector banks / nationalized banks / foreign banks have already implemented advanced technology based solutions like core banking solutions for providing their customers anywhere and anytime banking facility.

➤ TECHNOLOGICAL REVOLUTION IN CO-OPERATIVE BANKS:

The present cooperative banking scenario is far from the anywhere and anytime banking. This is mainly because system reengineering for anywhere and anytime banking, demands use of high level of technological tools on one hand and strengthening the infrastructural facilities like communication system, networking etc. on the other. In addition to this, enhancement of the knowledge skill of the employees of the banks, play an important role to achieve this end. This apart, the level of awareness amongst the customers, consciousness of the banks for extending such facilities to the customers is very low, so the Indian banking sector has not yet
considered the anywhere and anytime banking as one of the important parameters for their customer service.

The reason for non implementation of anywhere and anytime banking in the cooperative banking sector may be listed as follows:

- Lack of consciousness of the cooperative banks about extending the facilities like anywhere and anytime banking to the customers.
- Lack of awareness amongst the customers about their rights to various banking facilities
- Lack of the necessary computerised systems and tools.
- Lack of proper communication system required for such facilities.
- Requirement of the banks funds for investment on computer and communication system.
- Lack of knowledge and skill of the bank employees
- Inability of the customer to use IT related facilities due to lack of knowledge
- Resistance against change in the system at all levels i.e. the employees, management & the top executives of the banks.
- Delay in framing the required rules and regulations for implementing the electronic transactions.

Although technological developments and infrastructural improvements are coming up very fast, it needs a huge amount of investment for any individual bank to reap the full benefits of such developments/improvements. Many of the cooperative banks are not in a very sound position financially as the profitability of those banks is on a decline. Some banks are on the verge of closure, unless it recovers financially. Thus many banks in the country may not be in a position to invest such huge amount in the technological areas although it is highly necessary for their survival as the private sector banks and the foreign banks are posing stiff competition to them particularly in the areas of customer service, business growth and profitability. These banks (private, public, foreign) because of their sound capital base can invest huge funds for technological developments and are optimally using the IT tools for their benefit. In comparison with this, the cooperative banks are falling behind in this area due to their poor capital base. In order to cope with this tough situation, the weaker of
the cooperative banks may consolidate themselves by going in for a merger so that the
merged unit becomes a bigger one with a sound financial base and a stronger force to
reckon with. Once the banks attain the level of strong financial base, it will be easier
for them to invest funds on technological developments which are essential for
extending anywhere and any time banking to the customers.

The banks should also take steps for enhancing the level of knowledge and
skill of their employees at all levels including top executives on IT by imparting
training. The employees of all categories should be motivated through training on
behavioral science so that there is a perceptible change in their attitudes about the new
technologies that they are going to handle in the future. At the same time, the banks
have the responsibility of educating their customers so that they are accustomed to the
new environment.

- MANAGING TRANSFORMATION:

Initiative taken by RBI to manage transformation through computerization: The
first initiative in the area of bank computerization, stemmed out of the landmark
report of the two committees headed by the former Governor of the Reserve Bank of
India, his Excellency, Dr. C. Rangarajan. Both the reports strongly recommended
computerization of banking operations at various levels and suggested appropriate
architecture, as a measure to meet the winds of change.

Rangarajan Committee (I)

In the early 1980s a high level committee was formed under the chairmanship of
Dr. C. Rangarajan, then Deputy Governor of the Reserve Bank of India, to draw up a
phased plan for computerization and mechanization in the banking industry over a
five years time frame of 1985 - 89. The focus was on customer service and two
models of branch automation were developed and implemented.

Front office mechanization where front desk operations were computerized while
back office work was done manually, and Back office automation covering
mechanization of general ledger and back office operations while the front office
work was done manually. Both the models provided the customer with error free
accounting regular statement of accounts etc. Considering the contemporary level of
computerization, these were major achievement but did not go far enough and the pace of their implementation was tardy. some opposition from trade union existed.

**Rangarajan Committee (II)**

Having gained experience in the earlier mode of computerization, the second Rangarajan Committee, constituted in 1988 drew up a detailed perspective plan for computerization in Banks and for extension of automation to other areas like funds transfer, electronic mail Banknet Swift, ATMs etc. The committee recommended the following road map for computerization over the next five years.

- Around 2000 to 2500 large branches located at high activity (Urban and Metropolitan) centers to be fully computerized.
- Computerization of Regional Offices / Zones Offices / head Offices
- Inter and intra bank transactions using the Banknet set up by the RBI
- Installation of a network of cash dispensers / ATMs at strategic locations such as airports / railway stations etc. on a shared basis by banks.

The committee also made recommendations on the single window concept, all bank credit cards, credit clearing system, office automation, etc. in fact, this report was the most comprehensive road map for bank automation considering the state of the technology at that time. Within the RBI technology advances have been significant and present processes and systems have high technology content. Several initiative have been taken by RBI with the broad objective of providing systems which impact beneficially on efficient housekeeping in banks. better customer service and overall universal efficiency.
### Table No – 3.1

<table>
<thead>
<tr>
<th>Stages of Transformation</th>
<th>Structure of Banks</th>
<th>Objectives of the Banks</th>
<th>Mode of Transformation</th>
</tr>
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<tbody>
<tr>
<td>Pre Nationalisation of the banks (Before 1969)</td>
<td>Private Control of Banks</td>
<td>Higher Profitability</td>
<td>Manual Work</td>
</tr>
<tr>
<td>Post Nationalisation of the banks (1969-90)</td>
<td>Control of Government</td>
<td>Social Banking</td>
<td>Limited Computerisation</td>
</tr>
<tr>
<td>Stage of Information Technology</td>
<td>Implementation of Various Committee Reports.</td>
<td>New products &amp; Services, Entry in Insurance CRM with IT</td>
<td>Maximum use of IT. Mobile, ATMs, Credit / Debit Cards, Internet, Tele Banking, etc.</td>
</tr>
</tbody>
</table>

#### TRANSFORMATION FROM TRADITIONAL BANKING TO MODERN BANKING:

### Table No – 3.2

<table>
<thead>
<tr>
<th>TRADITIONAL BANKING</th>
<th>MODERN BANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell Products</td>
<td>Meet Customer Needs</td>
</tr>
<tr>
<td>Product Research</td>
<td>Customer Research</td>
</tr>
<tr>
<td>Product Sale &amp; Profitability target</td>
<td>Customer Segment Sale &amp; Profitability Target</td>
</tr>
<tr>
<td>Introduce New Offerings Every Few Months / Years.</td>
<td>Introduce Customer Specific New Offerings Every Week / Day.</td>
</tr>
<tr>
<td>Banking hours only</td>
<td>Any time Banking</td>
</tr>
<tr>
<td>Personal Contacts</td>
<td>Personal And Electronic Contacts.</td>
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## CONTENTS OF TRANSFORMATION

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<th>Old System</th>
<th>Transformation in Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Organizational Structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branches as only channel of Services</td>
<td></td>
<td>Multiple Channels integrated with IT</td>
</tr>
<tr>
<td>Concentration Of power</td>
<td></td>
<td>Decentralization and empowerment induced by IT supported MISIDSS</td>
</tr>
<tr>
<td>Large space and staff at branches</td>
<td></td>
<td>Limited space and staff requirement due to IT.</td>
</tr>
<tr>
<td>Non- dynamic</td>
<td></td>
<td>More dynamic</td>
</tr>
<tr>
<td>High organizational set up cost</td>
<td></td>
<td>Low set up cost</td>
</tr>
<tr>
<td>No international best practices</td>
<td></td>
<td>Adopting international best practices as suggested by Basel-II</td>
</tr>
<tr>
<td>(B) Capital Structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More investment by the govt. in capital (approx, 67%)</td>
<td></td>
<td>Disinvestments in PSBs (from 67% to 33%)</td>
</tr>
<tr>
<td>Limited capital</td>
<td></td>
<td>Raising more capital from the market</td>
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<tr>
<td>Less share of foreign capital</td>
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<td>Increase in foreign direct investment (FDI)</td>
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<td>More investment of funds by the banks in govt. securities</td>
<td></td>
<td>More investments in infrastructure</td>
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<td>No investment in insurance sector</td>
<td></td>
<td>More investments in insurance sector</td>
</tr>
<tr>
<td>Less merger and acquisition</td>
<td></td>
<td>Highly concentrating on consolidation through mergers and acquisitions</td>
</tr>
<tr>
<td>(C) Business Re - engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No marketing of financial services</td>
<td></td>
<td>More stress on marketing of financial services</td>
</tr>
<tr>
<td>Specific banking</td>
<td></td>
<td>Retail-banking, Social-banking</td>
</tr>
</tbody>
</table>
Focusing on volume of assets and liabilities               Market segmentation
Inadequate MISIDSS                                   Adequate MISIDSS
Selling of products / services without considering the likings of customers (lack of market survey) More market access/survey to know customer expectations and then launch products/services
Limited business                                    Unlimited business with quick entry of new products / services, IT, more non-banking services.
Limited channels of marketing                        Unlimited channels of marketing
High rate of NPA                                      Low rate of NPA as with the introduction of prudential norms and Securitization Act.
Limited competition                                  Cut-throat competition (inter and intra group)
Narrow banking                                       Universal banking (banking, insurance, securities, stock broking, portfolio management etc.)
No utility banking services                           Utility banking services (file tax returns, bill deposits, check clearance etc.)

3.4 **ELECTRONIC BANKING**

With the introduction of computers in Indian banks and with the advent of ATM’s, the banking services are provided across the banks. Customers need not necessarily visit the branch to do banking transactions, when the banks provide them with Tele – banking or remote – banking facility. This type of banking is called
electronic banking and the concept is becoming popular with individuals as well as corporate entities in India.

1. **ATM**: Automated Teller Machine (ATM) have eliminated the time limitations of the customer service, and offer a host of banking services, including deposits, withdrawals, requisitions, instructions and transfers. The customer need not be concerned much about the security, as most ATM locations have guards, or alternately are located in lobbies, access to which is electronically controlled by means of the customer’s ATM card. Access to the account is through a PIN (Personal Identification Number) which is strictly supposed to be known only by the cardholder. This access is also available for worldwide locations, giving the customer fingertip access to his accounts worldwide. The first bank to introduce the ATM concept in India was the Honking and Shanghai Banking Corporation (HSBC) in the year 1987. Now, almost every commercial banks gives ATM facilities to its customers. The first bank to cross 1,000 marks in installing ATMs in India is ICICI. But the private sector banks have taken the lead. ICICI, UTI, HDFC and IDBI counts more than 50% of the total ATMs in India. Public sector banks are also taking the installation of ATMs seriously for Indian market. They are either setting up their own ATM centres or entering into tie-ups with other banks. The corporation bank has the second largest network of ATMs amongst the Public Sector Banks in India. The Indian banks have also come up with a ‘Swadhan’ scheme. Under this scheme the banks can use each other’s ATM at a cost, usually Rs. 35 extra from their customers.

**Benefits to customers**: (4)

- 24 hours access availability.
- Less time for transactions.
- Acceptability of card across multiple bank ATMs, even foreign tourists can access Maestro / Visa Atms.
- Plethora of services available in addition to cash dispensing.

**Benefits to Banks**:

- Cost of setting up ATMs much lower than the branch.
• Migration of the routine transactions to the ATMs frees the banks staff for more productive work.
• ATM serves as the crucial touch points for cross selling of banks products.
• Enables the bank to display products on the screen and serves as a media for publicity for the bank.
• Less hassle in handling cash.

2. ANYWHERE BANKING:

With the introduction of ATMs and Tele-Banking, financial details can be accessed from remote locations and basic transactions can be affected even outside the bank. Inter station connectivity of ATMs has also facilitated withdrawals from other stations, a service particularly useful for frequent travelers. The facility of using credit cards on ATMs is also available and more recently, mutual arrangements between banks are made for allowing the use of any bank’s ATM card on any other bank’s ATMs.

3. TELEBANKING: Telephone banking is a service, provided by financial institutions like banks which allow their customers to perform transactions over the telephone. Tele-banking is a service which makes banking easy from any touch tone telephone, 24 Hours a day, by enabling the customers to:

1. Check their account balance
2. Check the last few transactions (depending on the bank’s policies)
3. Get mini statement
4. Request for cheque book, demand draft, stop cheque payment
5. Report loss of ATM/Debit card
6. Get product information
7. Pay utility bills
8. Transfer funds

Most telephone banking services use an automated phone answering system with phone keypad response or voice recognition capability. To guarantee security, the customer must first authenticate through a numeric or verbal password or through security questions asked by a live representative. Except cash withdrawals and deposits, Telephone Banking offers virtually all the features of an automated teller
machine like account balance information and list of latest transactions, electronic bill payments, funds transfers between a customer's accounts, etc. There is one other use for telephone banking, and that is for offshore purposes. For example, the banks operate a telephone banking service for its offshore customers, which makes perfect sense in saying that banks are managing finances on a global scale. In today's extremely competitive banking environment, consumers demand convenience, personalization and a proven commitment from the bank's customer service cell. Telephone banking delivers on the promise of any time, any place access, by instantly connecting your customers with their accounts and the information they want from any touch-tone phone. Enabling your customers to be "self-service" customers—ones who can obtain banking information and perform transactions, according to their own schedules—meets the growing consumer demand of ultimate convenience and autonomy.

➤ Security aspect for Telephone Banking:

Telephone banking security, protects the data entered by the customer using industry leading algorithms to encrypt the PINs between the server and the core middleware so that they are never in the clear in the transaction messages. Extensive security measures are in place to prevent unauthorised transactions.

1. List of accounts
2. Account balances
3. Funds transfers between accounts
4. Last 10 debits and credits
5. Card activation
6. Cleared cheque by cheque number
7. Order cheque book
8. Request statement
9. Bill Payments from account
10. Loan Payment from account
11. Interest rates notice
12. Instructions for stop payment of cheques.
13. Change password etc.

➢ Benefits of Telephone Banking:

1. Lowers the bank’s total cost of customer care, by reducing the call volume of customer service representatives and tellers.
2. Provider of quick-to-market solutions, which increases the value of resources.
3. Supports the bank’s marketing plans, with “Brandable” messages that play while a customer is waiting / on hold.
4. Improves customer’s and the bank’s productivity, by managing the flow of customer’s information.
5. Strengthens strategic positioning by increasing the customer’s loyalty by improving the customer service and achieving higher customer satisfaction.
6. Online account information, provides real-time account balances as the transactions occur, giving the account holder accurate, up-to-date information.
7. Providing the account holder secure financial transactions, 24 hours a day, 7 days a week, at any place.

4. MOBILE BANKING (6): Mobile banking (also known as M-Banking, SMS Banking etc.) is a term used for performing balance checks, account transactions, payments etc. via a mobile phone. Mobile banking today is most often performed via SMS or the Mobile Internet but can also use special programs called clients downloaded to the mobile device.
> **Definition of Mobile Banking**

In one academic model, mobile banking is defined as:

"Mobile Banking refers to provision and availment of banking- and financial services with the help of mobile telecommunication devices. The scope of the offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information."

According to this model, Mobile Banking can be said to consist of three interrelated concepts:

- Mobile Accounting
- Mobile Brokerage
- Mobile Financial Information Services

Most services in the categories designated Accounting and Brokerage are transaction-based. The non-transaction-based services of an informational nature are however essential for conducting transactions - for instance, balance enquiries might be needed before committing a money remittance. The accounting and brokerage services are therefore offered invariably in combination with information services. Information services, on the other hand, may be offered as an independent module.

> **Mobile Banking Services**

Mobile banking can offer services such as the following:

- **Account Information**
  1. Mini-statements and checking of account history
  2. Alerts on account activity or passing of set thresholds
  3. Monitoring of term deposits
  4. Access to loan statements
  5. Access to card statements
  6. Mutual funds / equity statements
  7. Insurance policy management
  8. Pension plan management
9. Status on cheque, stop payment on cheque

10. Ordering check books

11. Balance checking in the account

12. Recent transactions

13. Due date of payment (functionality for stop, change and deleting of payments

14. PIN provision, Change of PIN and reminder over the Internet


- **Payments, Deposits, Withdrawals, and Transfers**

  1. Domestic and international fund transfers

  2. Micro-payment handling

  3. Mobile recharging

  4. Commercial payment processing

  5. Bill payment processing

  6. Peer to Peer payments

  7. Withdrawal at banking agent

  8. Deposit at banking agent.

**Benefits to customers:**

- Customers need not stand in the bank counters / front offices for various enquiries about his account.

- Customer can save his valuable time in banking transactions.

- Give information at anytime and anywhere.

- Customers can pay his utility bills in time and save paying penalties.

- Plan funding his accounts for the cheques issued to various customers.

- Cheque book request can be made sitting in his work place.
Benefits to Banks:

- Bank can utilize the time saved for expenses of business, marketing and sales activities by channel migration of customers to mobile banking.
- Bank can take advantage of profits by way of commission for cellular companies by selling prepaid talk time through ATMs.
- Banks providing mobile banking services can have competitive advantage on those banks, which are not providing this services.
- Mobile banking enables banks to reduce costs of courier, communication and paper works etc.

5. **SMS BANKING**

Businesses are in move. So is to be your money. You may have to thank the banks which are providing banking at the end of your SMS. The technology is at its highest level to move your money while you are on the move. If you are having non – WAP enabled mobile handset, you can use the facility of SMS services. The following operations can be easily used by the service provider.

- Bill Payment
- Balance Enquiry
- Statement request
- Demat free balance holding
- Demat last two transactions
- Last three transactions
- Cheque payment status.
- Cheque book request.

The SMS facility brings peace of mind to customers and opens doors to many more technological possibilities and innovative services. It is very similar to how an ATM works. To use ATM, a card is necessary and to use SMS service, a mobile phone is necessary. In both the cases a secret number is required to access.
6. **INTERNET BANKING**

E-banking refers to electronic banking. It is like e-business in the banking industry. E-banking is also called as "Virtual Banking" or "Online Banking". E-banking is a result of the growing expectations of bank's customers. E-banking involves information technology based banking. Under this I.T system, the banking services are delivered by way of a Computer-Controlled System. This system does involve direct interface with the customers. The customers do not have to visit the bank's premises.

With the popularity of PCs and easy access to internet and World Wide Web (WWW), banks increasingly use internet as a channel for receiving instructions and delivering their products and services to their customers. At the basic level, internet banking can mean the setting up of a web page by a bank to give information about its products and service. At an advanced level, it involves provision of facilities such as accessing accounts, transferring funds, and buying financial products or services online.

The Reserve Bank of India constituted a working group on Internet Banking. The group divided the internet banking products in India into 3 types based on the levels of access granted. They are:

- **Information Only System**: General Purpose information like interest rates, branch location, bank products and their features, loan and deposit calculations are provided in the banks website. There exist facilities for downloading various types of application forms. The communication is normally done through e-mail. There is no interaction between the customer and bank's application system. No identification of the customer is done. In this system, there is no possibility of any unauthorized person getting into production systems of the bank through internet.

- **Electronic Information Transfer System**: The system provides customer-specific information in the form of account balances, transaction details, and statement of accounts. The information is still largely of the 'read only' format. Identification and authentication of the customer is through password. The information is fetched from the bank's application system either in batch mode
or off-line. The application systems cannot directly access through the internet.

- **Fully Electronic Transactional System**: This system allows bi-directional capabilities. Transactions can be submitted by the customer for online update. This system requires high degree of security and control. In this environment, web server and application systems are linked over secure infrastructure. It comprises technology covering computerization, networking and security, inter-bank payment gateway and legal infrastructure.

Online banking is rapidly gaining popularity, as more and more customers recognize its advantages. Most banks charge less fees if you use their online services. You could even avoid receiving paper statements if you like, and conduct most of your business online.

Internet banking can be categorized in following stages:

- **Information Kiosks**: traditional information on banking products and services are available on the website of the bank.

- **Basic I-Banking**: Here, bank sets up infrastructure for internet banking and for accessing basic services like opening an account, paying utility bills and checking the balance.
• **Virtual medium**: Here internet is taken as an official medium for financial transactions. Buying and selling activities can be undertaken through banks payment gateway technology. Today most of the banks are having their own functional websites through which banks are serving customers.

**UNIQUE FEATURES OF INTERNET BANKING :**

Online banking solutions have many features and capabilities in common, but traditionally also have some that are application specific.

- Support account aggregation to monitor accounts in one place
- Make fund transfers between own accounts and third party accounts
- Interbank fund transfer
- Maintenance of future fund transfers
- Maintenance of beneficiaries
- Make Payment on bills to service providers
- Maintenance of registered bill payment
- Manage our investments with placement in our General Investment Account
- Withdrawals with details of investment history
- Initiate standing instructions and delete them
- Manage financing accounts payment facility financing details
- Manage Card account
- Manage cheques status inquiry
- Stop cheque facility
- Cheque book request
- Cheque return inquiry
- Cheque deposit inquiry
- Current Account statement request
- Profit rates inquiry
- FOREX rates inquiry
- Update profile
- Change account correspondence address
- Change password
- Send message to Internet Banking customer care
- Delete ATM card in cases of loss or authorized usage.
SERVICES THROUGH E-BANKING:

- **Bill payment service** It facilitates payment of electricity and telephone bills, mobile phone, credit card and insurance premium bills as each bank has tie-ups with various utility companies, service providers and insurance companies, across the country. To pay our bills, all we need to do is complete a simple one-time registration for each biller. We can also set up standing instructions online to pay our recurring bills, automatically. The bank does not charge customers for online bill payment.

- **Fund transfer** We can transfer any amount from one account to another of the same or any another bank. Once we login to your account, we need to mention the payees’ account number, his bank and the branch. The transfer will take place in a day or so, whereas in a traditional method, it takes about three working days. ICICI Bank says that online bill payment service and fund transfer facility have been their most popular online services.

- **Credit card customers** With Internet banking, customers can not only pay their credit card bills online but also get a loan on their cards. If we lose our credit card, we can report lost card online.

- **Railway pass** Indian Railways has tied up with ICICI bank and we can now make our railway pass for local trains online. The pass will be delivered to us at our doorstep. But the facility is limited to Mumbai, Thane, Nasik, Surat and Pune.

- **Investing through Internet banking** We can now open an FD online through funds transfer. Now investors with interlinked demat account and bank account can easily trade in the stock market and the amount will be automatically debited from their respective bank accounts and the shares will be credited in their demat account. Moreover, some banks even give us the facility to purchase mutual funds directly from the online banking system.

- **Recharging prepaid phone** Now we just top-up our prepaid mobile cards by logging in to Internet banking. By just selecting our operator's name, entering our mobile number and the amount for recharge, our phone is again back in action within few minutes.
• **Shopping** With a range of all kind of products, we can shop online and the payment is also made conveniently through our account. We can also buy railway and air tickets through Internet banking.

❖ **ADVANTAGES OF ONLINE BANKING:**

The advantages of online banking are as follows:

- Convenient
- Unaffected by binding of operational timings.
- No geographical barriers
- Services can be offered at very low cost
- Cost per transaction through internet banking is very low.

❖ **BENEFITS OF INTERNET BANKING TO THE CUSTOMER:**

- Customers do not have to wait for their balance to be updated when they make a transaction since it is instantly reflected in their account balance.
- It is easy to transfer funds between customer's accounts, even if they are in different branches or cities.
- Requests for Demand Drafts and Banker's cheque issued from his account can be made by the customer by giving details of amount, location and beneficiary.
- Stop Payment Request can be made on a cheque or cheques on-line. All the customer has to do is enter the cheque number and the reason for stopping payment.
- The customer can view the status of a specific cheque that he has issued on any of his accounts.
- The customer can request for a new cheque-book on-line.
- The customer can find out what balance he holds in his accounts.
✓ Banking transactions can be carried out safely and with total confidentiality. The system is secured. Therefore the customer can be sure that his account information can be accessed only by him.

The acceptance of Internet banking is redefining the relationship between banks and their customers. With customers becoming more intelligent and sophisticated, in future they will demand many more products than simple savings account. The Internet allows for more transparency in assessing products, where customers can peruse their screens for the best products, services and prices for their banking needs.

✧ CHALLENGES IN INTERNET BANKING:

Internet banking in India is in its earliest stage of development. Most of them are offering basic services only. The deregulation of banking industry coupled with the emergence of new banking technologies is enabling new competitors to enter the financial services market quickly and efficiently. The following challenges are faced by the Indian banking:

• **Proper understanding of the customer** For this a massive survey must be undertaken may be in collaboration with other banks.

• **Need for transparency** in offering services as customers awareness has grown considerably.

• **Breach of privacy** online transactions enter straightaway into the records revealing the identity of customer. Thus black money cannot be transferred with ease.

• **Bandwidth** Though companies claim to offer good speed and high bandwidth, still there are problems in accessing high speed on net. Internet banking can go
high only on the wings of proper infrastructure comprising telecommunications and bandwidth.

- **Computer literacy in India is still very low** and that is a barrier in fast acceptance of Internet banking.

- **The mindset** of the Indian customer needs to be changed.

- **Cracking login and passwords** is a common way of fiddling with the data.

- **Denial of services** Directing millions of queries can block computer network.

- **Data Diddling** Data can be modified in an unauthorized manner. A customer can therefore receive bills of higher amounts than the actual transactions.

- **Session hijacking** Hijackers become unauthorized intermediaries between the server and the client; they can then hijack the data and prevent it from reaching the destination. Most online transactions involve disclosing up of the credit or debit card number. Hackers can very easily track down these numbers. They can thus enjoy the full benefits of the card without being an actual cardholder.

- **GUIDELINES:**

  RBI has issued some guidelines on Internet banking for safety of customers and banks. Some of which are:

  - Application for account opening can be accepted over Internet but account should be opened only after proper introduction and physical verification of the customer.

  - Security procedure adopted by bank, for authenticating user, must be recognized by law as a substitute for signature, from a legal perspective.

  - The secrecy and confidentiality of customers account has to be maintained.

  - Consumer Protection Act is applicable to banking services as well.
Information Technology Act 2000 has given legal recognition to creation, transmission and retention of an electronic (magnetic) data to be treated as evidence in court, except in those areas which continue to be governed by the provisions of Negotiable Instruments Act 1881.

❖ SECURITY PRECAUTIONS

Customers should never share personal information like PIN numbers, passwords etc with anyone, including employees of the bank. It is important that documents that contain confidential information are safeguarded. PIN or password mailers should not be stored, the PIN and / or passwords should be changed immediately and memorized before destroying the mailers.

Customers are advised not to provide sensitive account-related information over unsecured e-mails or over the phone. Take simple precautions like changing the ATM PIN and online login and transaction passwords on a regular basis. Also ensure that the logged in session is properly .

Internet banking is changing the banking industry and is having the major effects on banking relationships out.

• SECURITY TOKEN DEVICES :

✓ Protection through single password authentication, as is the case in most secure Internet shopping sites, is not considered secure enough for personal online banking applications in some countries. Basically there exist two different security methods for online banking.

✓ The PIN / TAN system, the PIN represents a password which is used for the login and TAN represents one-time passwords to authenticate transactions. TANs can be distributed in different ways; the most popular one is to send a list of TANs to the online banking user by postal letter. The most secure way
of using TANs is to generate them by need using a security token. These token generated TANs depend on the time and a unique secret, stored in the security token which is called two-factor authentication or 2FA. Usually online banking with PIN / TAN is done via a web browser using SSL secured connections, so that there is no additional encryption needed. Signature based online banking where all transactions are signed and encrypted digitally. The Keys for the signature generation and encryption can be stored on smartcards or any memory medium, depending on the concrete implementation.

Attacks

✓ Most of the attacks on online banking used today are based on deceiving the user to steal login data and valid TANs. Two well known examples for those attacks are phishing and pharming. Cross-site scripting and key logger / Trojan horses can also be used to steal login information.

✓ A method to attack signature based online banking methods is to manipulate the used software in a way, that correct transactions are shown on the screen and faked transactions are signed in the background.

Counter Measures

✓ There exist several countermeasures which try to avoid attacks. Digital certificates are used against phishing and pharming, the use of class-3 card readers is a measure to avoid manipulation of transactions by the software in signature based online banking variants. To protect their systems against Trojan horses, users should use virus scanners and be careful with downloaded software or e-mail attachments.
Internet Banking for Online Purchases.

In a typical set up, the procedures for doing online purchases would go something like this:

- Make the purchase you want.
- Select the payment option using internet banking.
- You have to enter your User ID and Login Password.
- Then select the Bank using which we desire to pay.
- Your transaction password should be entered.
- Your selected account will be debited by the purchase amount.

The service provider will deliver the goods/services bought in due course as per their delivery norms.

Payment of Bills through Internet Banking.

A typical procedure for bill payments would be like this:

1. If you are registered for Personal Internet Banking all you have to do is to simply log on and select “Pay Bills.”

2. From the menu choose ‘Add a Payee’ to create your ‘payee’ list i.e. the companies or the people you wish to pay. Enter the name, address and account number for each (keep your current bills handy for this purpose. Internet Banking will store the new payee information so we will only have to enter it once.

3. Log on to Internet Banking when you want to pay a bill, select the appropriate ‘payee’ from our list, then enter the amount and the date we want the payment to be processed.

4. That is all what you have to do. The bill payment will be processed on the date you selected.
7. **HOME BANKING**: Today banking customers are more affluent and technologically sophisticated than ever before, with less and less time available to conduct routine banking business, more and more of them have become comfortable with the idea of using machines for a wide range of banking services.

a) **PERSONAL COMPUTER (PC) BANKING**:

PC banking means Personal Computer based home banking services to other banks. In this case customer can contact their banks from their home by using their personal computer. User-friendly - PC Banking displays easy-to-follow links to account summaries, transactions and other on-line services. It is a flexible system through which customer can easily transfer information from their PC to their banks. Customer can also submit electronic loan applications through PC Banking. With the help of PC banking, the customer can also perform the following transactions:

1. Transfer funds
2. Make loan payments
3. Request withdrawal cheque
4. View current balances
5. View account history
6. View cleared cheques
7. Add a product or service to your existing account
8. Read alert messages on your account
9. Update your password
10. Apply for a loan
11. Report a lost or stolen ATM, debit or credit card

PC banking uses software like Quicken, Quick Books and Microsoft Money to get connected to the customer’s bank. PC banking allows the customer / user to manage the entire transactions like handling saving account, loan account, investment transactions, paying bills etc. with the help of personal computer.
b) CORPORATE BANKING :

Remote banking has become very popular among corporate customers especially big business / industrial houses which are already automated. More and more banks are providing customer terminals right in the customer's office, which facilitates the customers to operate the account without physically coming to the bank. For availing these services from the banks which have this facility, the customer requires a computer, a telephone connection and a modem. Moreover, any of these items need not be dedicated for this purpose and could be utilized only at the time of performing banking transactions thereby do not involve any additional investments. By obtaining a special SWIFT (Society for Worldwide Inter-Bank Financial Telecommunication) authentication facility in arrangement with their bankers, customers will be able to directly prepare messages in the SWIFT format by sitting in their office, and transfer the particulars in the respective templates to their bankers. The bankers will directly authenticate the transaction thereby the entire transaction is completed across the globe within minutes.

CORPORATE BANKING

a. PERSONAL BANKING :

By using Tele – banking facility, customers can dial up the branch's designated telephone number, which is connected to the computer and, by dialing his identification number, will be able to get the connectivity to the branch's designated computer. The software provided in the machine will be interactive with the customer
asking him to dial the code number of the service required by him and suitably answers him. A customer can have access to his balance, and also can place order for statement of account, cheque books and few selected services through this Tele ( Phone ) Banking. The customers who have modems and a personal computer at home can have a direct connectivity with the branch's computer through telephone line, and can obtain similar services, besides additional services like transferring the statement of his account from the branch's computer to his own personal computer.

3.5 NETWORK SCENARIO IN INDIA: (8) (9)

The committees on communication networks for banks, set up in 1987 under the chairmanship of Shri T.N. Anantharam Iyer, executive director, Reserve Bank of India, had strongly recommended for the establishment of a cooperative communication network especially for the banking industry. Based on the recommendations of this Committee, a communication network, 'Bank net' was set up in the year 1991 by the RBI to facilitate inter-bank transfer of messages within India. It is primarily meant for the exclusive use of the banking industry and other financial institutions and links seven cities, viz., Mumbai, New Delhi; Kolkata, Chennai, Bangalore, Hyderabad and Nagpur through leased lines. However, Bank net has not proved quite popular with the banking community because of the unreliable uptime of the links and limitations in the communication software, COMET. In the meantime, the second Rangarajan Committee had recommended the interconnecting of these branches and interfacing them with the public data network.

Following are some of the public data networks developed for the information processing. Bank Net and SWIFT are the two networks designed exclusively for the banks and other financial institutions for their communication needs.

- **INET**

  NET was set up by the department of telephones in the year 1991. It is a fast, reliable, flexible and quite cost effective data communication network. It is a X.25 data network based on the Packet Switched Public Data ( PSPD ) technology with an error detection and correction techniques. NET allows both way connectivity to:

  - Remote Area Business Message Network ( RABMN )
  - High speed VSAT Network ( HVNET )
• Gateway packet switching system (GPSS) of VSNL at Mumbai

Typical Applications: NET is useful for the following applications:

• Electronic Mail Services
• Information Retrieval
• Remote Login
• Electronic Funds Transfers.

• NICNET

NICNET has been set up by the National Informatics Centre (NIC), a Government of India organization. It is India's largest Wide Area Network (WAN). The Master Earth Station is installed in New Delhi, to provide access to satellites and operates from around 650 VSAT terminals. Presently, it allows access to about fifty networks in more than thirty countries. The access is both through leased lines as well dial-up connectivity. It was set up primarily for data collection from 480 districts and facilitates information management from geographically dispersed locations all over India. Though, it has mainly been set up to serve the communication needs of the Central/State Governments, yet banks in India have also been allowed connectivity and are using NICNET for e-mail services. It operates on various backbones, viz., Packet Switched networks, LANs and ISDNs.

• INDONET

It was setup by CMC Ltd., in the 1980s and was among the first countrywide networks in India. It has host computers at Hyderabad, Mumbai, Delhi, Kolkata and Chennai and access points at Pune, Vizag, Bangalore and Ahmadabad. It also provides a gateway to INET for a wider geographical spread in India and connectivity to other international networks. Like, Telnet, Tymnet of USA, Telepack of Singapore, Datex of Germany. It has recently added fault tolerant mainframes which offer high uptime and greater processing facilities.

• BANKNET

It is a common communications network operated by banks and financial institutions on a co-operative basis within the country. It can be used for

1. Transfer of funds from one place to another.
2. Exchange of statistical information among banks.
3. Settlement of funds between banks.
4. Foreign exchange operations.

In the case of transfer of funds, it enables the customer to draw cash against his deposit at any branch of the bank and also deposit cash at any branch for credit to an account at some other branch. Advance can be taken from one branch against deposit at some other branch.

During the first phase of reforms in the Indian Financial Sector, a need was felt to develop an Institute of Higher Learning, which would also provide the operational service support in Information Technology to Banks and Financial Institutions.

The foundation for induction of Computer Technology in the Indian Banking Sector was laid by Dr. Rangarajan Committee's two reports in the years 1984 and 1989. Both the reports strongly recommended computerization of banking operations at various levels while suggesting the appropriate architecture.

In the year 1993, the Employees' Unions of Banks signed an agreement with Bank Managements under the auspices of Indian Banks' Association (IBA). This agreement was a major breakthrough in the introduction of computerized applications and development of communication networks in Banks.

In the following two years, substantial work was done and the top managements realized the urgent need for training, research and development activities in the area of Banking Technology. Banks and Financial Institutions started setting up Technology-based training centers and colleges. However, a need was felt for an Apex Level Institute, which would be the Brain Trust for Banking Technology and Spearhead Technology Absorption in the Indian Banking and Financial Sector.

In the year 1994, the Reserve Bank of India formed a committee on "Technology Up gradation 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 of 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 of the country. “ As
recommended by the Committee, the Institute for Development & Research in Banking Technology [IDRBT] was established by the Reserve Bank of India in 1996 as an Autonomous Centre for Development and Research in Banking Technology.

- **RBI Net**

RBI Net communication software, allows for free format messaging and file transfer on the existing BANKNET infrastructure with the help of servers installed at the four metros. Each RBI Net user interacts with the local server connected to the X.25 switch. The UNIX servers in turn communicate with each other using TCPIIP over the X.25 protocol. The software allows free format messaging without any restrictions on the length of the message; enables file transfer (spreadsheets, data bases, programs, etc.), facilitates dial-up access, and has security features, such as end-to-end encryption, audit trail, etc. RBI Net is also being used by several departments of the bank for various applications such as:

(i) Transmission of Sec. 42(2) of the RBI Act, 1934, data by commercial banks to regional offices of Department of Banking Operations and Development (DBOD) and furnishing of consolidated data by the regional offices of DBOD to central DBOD.

- **RBI's VSAT Network**

As per the recommendations of the Saraf Committee, the Reserve Bank of India decided to set up a countrywide data communication network for banks linking major centers of the country. Because of the poor quality of the terrestrial communication lines in the country, this network uses satellite communication with very small aperture terminals (VSATs) as earth stations to ensure a reliable infrastructure. VSATs provide communication channels of high quality and can be installed and operated in widely dispersed locations irrespective of the distance and the terrain. A large number of Indian banks have already installed VSATs for connecting their branches/offices in the network.

**User group network**: VSAT network is a single closed user group network for the exclusive use of the banks and other financial institutions. The system involves the use of earth stations (VSATs) at different locations and a central hub station for routing data/voice/video communications through satellite. The VSATs are owned by the individual banks and the RBI. The hub is owned by the RBI and the Institute for Development & Research in Banking Technology.
Development and Research in Banking Technology (IDRBT). This institute was set up by the RBI at Hyderabad to look into the technological issues and solutions for the banking industry. The INFINET has since started its operations w.e.f. 19 June 1999.

✓ **Applications on VSAT Network**

Since all offices cannot have VSATs, an integration of terrestrial lines comprising fibre optic cables, dial-up lines, etc., with the VSATs will provide connectivity to a large number of branches / offices. A pictorial depiction Figure 31.2.

Reserve Bank has listed the following applications which can be used on the system-

- Anywhere/Any Time Banking
- Electronic Fund Transfer
- Plastic Cards Implementation
- Inter - branch Reconciliation, accounting and transfer.
- Settlement Systems
- e-mail, circulars, corporate website for employees
- Customer database
- Audit and inspection of computerized branches
- MIS for credit risk management
- Settlement of securities
- Participation in money, forex, money markets, etc.
- Reporting to RBI
- Financial EDI-SP (Straight through Processing)
- Cash management system
- Software distribution and management
- Treasury management products.

However, to start with, the banks are making use of the INFINET for free format messages and for Exchange of information on cash management products, MIS for risk management and ALM, reporting and reconciliation of DDIMTT or remittance, funds management, circulars, etc.

It is expected that when fully operational, this network will usher in a new era of banking services through technological advents cutting across the geographical limitations of distances.
INFINET:

The 'INFINET' (Indian Financial Network) is a satellite-based wide area network using VSAT (Very Small Aperture Terminal) technology set up by the RBI in June 1999. The hub and the Network Management System of the INFINET are located in the Institute for Development and Research in Banking Technology, (IDRBT) Hyderabad. Among the major applications identified for porting on the INFINET in the initial phase are e-mail, Electronic Clearing Service - Credit and Debit, Electronic Funds Transfer and transmission of Inter-city Cheque Realization advices. Later, other payment system related applications as well as Management Information System (MIS) applications are proposed to be operationalized.

SWIFT:

Society for Worldwide Inter-bank Financial Telecommunications (SWIFTs) was founded in 1973 by 239 banks spread over fifteen countries with an objective of creating a unified international transaction processing and transmission system to meet the ever-growing telecommunication requirement of the banking industry. It is a cooperative non-profit making organization established under Belgian law with its headquarters at Brussels. SWIFT is wholly owned by its member banks. Swift is basically a message transmission system. All the transactions are processed without the exchange of paper, bank note, cheque, draft, etc., and as such is a true epitome of paperless banking. In India, all nationalized banks are members of SWIFT. Bank locations are connected to the SWIFT regional processor at Mumbai.

Main Features of SWIFT

• It is operational throughout the year twenty-four hours a day.
• Transmission of the messages to any part of the world is almost immediate.
• All the message formats for inter-bank transactions are standardized. At present, about 400 different standardized formats are used by SWIFT for message transmission.
• All messages are acknowledged (either accepted or rejected). Information is confidential and is protected against unauthorized disclosure and tampering.
• SWIFT assumes financial liability for the accuracy and timely delivery of all
validated messages from the point they enter the network to the point they leave the network.

- Method of transmission is cost-effective.

**Developments in SWIFT**

SWIFT has helped in standardizing and automating the international payments messaging. SWIFT has also allowed its facilities to non-banking financial institutions of technology in India are largely directed towards improving procedures rather than deriving the advantages afforded by it. Now some progress has been made with the introduction of ECS and EFT system in the country.

**CORE BANKING**

After the turn of consolidated databases (Back Office Application) and networks (Total Branch Automation) the next term is core banking applications. Core Banking Applications (CBS) in Banks provide the complete front-end and backend automation of banks. These applications also help the banks to achieve centralized processing of each and every service of the customer. "Core Banking applications provide anywhere, anytime 24 by 7 non-stop services, which is not possible with traditional localized branch automation systems. These applications also provide automation across multiple delivery channels. Core banking is a newly developed concept adopted by banks. Core banking is a centralized system that provides accounting, customer information management and transaction processing functions. It provides a central operational database to bank's assets and liabilities, a transaction processing engine and a system for the financial management of the bank. In core banking, a branch will become a service outlet like an ATM booth. Thus, the importance of physical branches will be reduced. In case of core banking, customer can operate their account from various locations like- customer can open an account at one location and can deposit a cheque, check bank balance, withdraw cash, get demand draft, get account statement, transfer funds, other transactions from various different locations of different cities. Implementation of core banking in banking sector allows interconnectivity of branches with the centralized data centre. Core banking is just one part of a fairly complex architecture of today's banking which takes care of the essential banking activities. The major Banks in India, both in the
private and public sectors are moving towards core banking solutions. Basically, core banking means performing accounting transactions like depositing, withdrawals, availing loan, repayment of bills, statement of account etc. through the multiple delivery channels like ATMs, Internet banking, and new branches. For the last couple of years the focus is on Core banking. With the implementation of core banking systems across banks, the usage level of IT for customer management has increased. The Core banking system has enabled banks to launch & targeting new products and services at specific customer segment, after understanding their banking and investment requirements. Core banking therefore all about knows the customer's needs. It is providing them with the right products at the right time, through the right channels, 24 hours a day 7 days a week. A super breed of core banking systems has emerged, which offer functionality in addition to core banking. These systems, called universal banking systems, can accommodate combinations of banking services such as retail, wholesale, private banking and securities trading. An advantage of using a universal system is that the data can be transferred easily between the different modules, so a bank can identify customer trends or selling opportunities. For example if a customer has high levels of cash balances and also performs securities trading then there may be a sales opportunity for private banking services. A disadvantage is that it is unlikely that a single vendor is able to offer modules that are 'best of breed' in each function. The alternative approach is to use a core banking system and supplement its functionality by using 'best of breed' packages for the specific functionality needed such as foreign exchange trading or portfolio management etc.

The following modules are offered by the Core Banking Solutions (CBS):

- **Customer information files management**: This module provides centralized access to all customer-related information. This transaction allows the bank to change the information fields without modifying the underlying software.

- **Deposit management**: This transactional module offers automated, real-time posting and highly efficient deposit processing for all the balance-based liability products. It also provides back up support for opening, settling, and closing card and check account contracts.

- **Loan management**: Loan management is an automated process for many lending products like secured and unsecured loans. It helps the bank in creating a flexible/
tailor made product portfolio and streamlining the processes according to the customer’s need.

- **Security management:** This facility helps banks to manage the following products and security processes like:
  - Security agreements such as real estate liens, registered liens, pledges, assignments, and guarantees.
  - Security amounts.
  - Encumbrances by the banking institution or a third party.
  - Declaration of purpose (Specific or global)
  - Relationships between assets, transactions, and security agreements – including guarantee pools.
  - Assignment and deletion of guarantee.
  - Relevant calculations – including security cover, security distribution, loan-to-value ratios, free security and security shortfalls.

- **Reserve for bad debts:** This module supports risk monitoring, provisioning, and realization of bad-debt charges.

- **Limit management:** This module indicates the liability limits and actual liability levels of business units and partners. Limit management checks the transactions against liability limits assigned to the borrowers.

- **Financial accounting:** The Financial Accounting function supports the general ledger transactions and finance management transactions at all the organizational levels, thus improving the management control and reporting.

- **Complementary third-party products** are also available to help the bank by managing the teller machines and payments.

Branches of a bank within and outside the city can be interconnected as part of a single computerized network. It enables the customers to operate their savings or current accounts from any branch of the bank from anywhere in India. Suppose a customer happens to be in Mumbai and needs urgent cash and his account is in the bank's branch in Delhi. He can walk into Mumbai branch of that bank and access his account via the network. He can withdraw cash from his savings account in another branch giving a self cheque to the teller; he can deposit a cheque in one city to be credited in his savings account in another city; he can even transfer money between
two accounts in different cities. Inter branch network also connects the bank’s ATMs across many cities.

Core banking has a centralized branch computerization model where the branches are connected to a central host, which incorporates branch automation modules and online multiple delivery channels like ATM, Debit Card, Tele-banking/mobile banking, Internet Banking, etc., under one roof. In core banking, there is a centralized database for the bank and transactions are done centrally, online. It offers integrated products and services to customers round the clock. There is scope for induction of modern banking services and one single software for all the branches and is operated on the bank’s WAN infrastructure.

❖ KEY FEATURES OF THE SYSTEM:

- **24 X 7 Banking**
  
  As a result of implementing Core Banking, most of the facilities being offered by banks, are available to Customers 24 hours a day, 7 days a week. The transactions are performed using multiple channels such as ATMs, Internet Banking, Phone Banking and Mobile banking. Further, the transactions using these delivery channels are updated in the CDC in real time.

- **Anywhere Banking**
  
  Customers can avail of banking services across the branch and Channel network irrespective of location where their account is maintained.

- **Integration with strategic sectors**
  
  Core Banking integrates all strategic sectors of Banking such as Trade Finance, Treasury, Asset-Liability Management and Corporate Balance Sheet. As a result, the information related to these areas is centrally available for use or reference.

- **Strengthening MIS, DSS and EIS**
  
  Core Banking Solution is more than just a transaction processing system. It provides updated data for generating various reports for Management Information System (MIS), and will facilitate Decision Support System (DSS) and Executive Information System (EIS). As data is located on CDC, branches and administrative offices can concurrently avail updated data when required.
• **Business Process Re-engineering (BPR) - enabler**

Core Banking would enable implementation of BPR initiatives of a Bank and facilitate centralized handling of various processes. Branches would do less and less back office work and would be able to focus on marketing, customer relationship management and cross selling.

**COMPONENTS OF CORE BANKING SOLUTION:**

Major components of a core banking solution are:

- Data centre
- Network connectivity
- CBS application software
- Hardware at branch and data centre
- Delivery channels
- Disaster recovery site
- A strong business continuity plan

**CORE BANKING SOLUTION ARCHITECTURE:**

In the CBS set-up, all the servers are hosted at a central place called the data centre. Data centre can also be outsourced. The data centre should have high end infrastructure in the form of robust access control, 100% fire-proof, Non-stop power supply, AC, reliable connectivity and high speed internet facility etc. The generic architecture is a three tiered architecture as shown below:

CBS runs on the WAN. The central server is located at the Data centre. Generally there is no application running at the aggregation points. However, the aggregation points will be having the network components. Branches have a branch server which acts as a gateway to the branch. To this branch server various nodes of the branch are connected.
The system architecture is generally as follows.

**CHART NO. 3.2 System Architecture**

- **Web server**
  - Database server DB
  - Accessed by branches
  - Provides front end screens and forms to users

- **Application Server (APS)**
  - Contains Application
  - Business logic running
  - Processes requests from servers
  - Accesses the DB server

- **Database server DB**
  - Hosts RDBMS (Oracle / SQL etc)
  - Processes requests from APS
  - Data Stored in external storage

The set up as explained in the diagrams above are general in nature and many banks have implemented CBS in this way. However a different architecture may also be implemented by some banks as dictated by the application deployed.
The connectivity architecture could be different for different institutions depending upon the technology adopted and the connectivity service chosen. Generally banks have a generic Wide Area Network Design as depicted below:

**CHART NO. 3.3   Wide Area Network Design**

```
DATA CENTRE

Leased Line / MPLS – VPN etc

Aggregation Point   Aggregation Point   Aggregation Point

Branch    Branch    Branch    Branch    Branch    Branch
```

As shown above branches could be connected to a common point called the aggregation point (which could be the circle / Zonal / Regional / Divisional Offices of the bank). The aggregation points in turn will be connected to the data centre. The primary medium of connectivity could be Leased lines and ISDN (Integrated Services Digital Network) lines will act as the backup. Transactions after being recorded at the data centre are simultaneously passed on to the backup / DR site. Remote trouble shooting capability is also available in the data centre besides the network monitoring software at the datacenter to monitor connectivity. System software, RDBMS, Anti-Virus as well as data centre make up the core of the CBS. Data centre will generally have a backup site with full replication of hardware, software, Network components and personnel. Let us look at the benefits to the branch, to the customer and to the bank as a whole.

**Benefits To The Branch:**

- As the back office work is done at a centralized location, more time is available to the branch officials for activities like product promotion, marketing, business expansion and cross selling of products.
• Single window service for the varied needs of the customers is made available at the branches. This enhances customer service at the branch
• There is a uniform approach to the branch rules / operations
• Branches can concentrate on developing business.
• Standardization of IT infrastructure at the branches.
• No End of Day (EOD) / Beginning of Day (BOD) process at the branch
• No local server and hence no local backup and other administrative chores

✓ **Benefits To Customers :**
• Anywhere / anytime branch banking is available to the customers
• As multiple delivery channels are facilitated, Internet banking, online access to all ATM network, tele-banking facility, bill payment facility etc are made available to the customers.
• Customer becomes customer of the bank
• Improved customer service at the branches
• No need to visit the branch as the multiple delivery channels enable the customer to transact basic banking even from the comfort of her home /office

✓ **Benefits To Bank :**
• Instant availability of consistent and accurate data.
• MIS at a central location enhancing the decision support for the top management.
• There will be effective control and monitoring by the top management.
• Data base and processing are centralized leading to better monitoring of the business and reduction in data cost and transaction cost.
• Faster introduction of customer centric products from the central location ensuring uniformity in implementation.
• Roll out of new products / Business changes can be implemented immediately
• New delivery channels can be integrated easily
• The need for reconciliation among the branches is eliminated thereby improving better housekeeping and better operational risk management
• Ease of system administration and thereby reduction in support costs. Information system security is ensured as the Information processing facility is centralized.
• Since the transactional as well as master data of all the branches is available at a centralized location, it is easy to set up Data-warehousing which will provide a decision support system.
• Critical nationwide payment system products introduced by the regulator such as RTGS, NDS, CFMS, and SFMS etc can be implemented and integrated with the core banking at the data centre.

✓ There are also certain **risks** involved in the implementation of CBS. These are:
• All eggs are in a single basket and hence the effect of centralized failure will be colossal resulting in reputation risk for the bank.
• The dependence on vendors and service providers increases
• Data Integrity and data security have to be ensured all the time as the centralized location will be the target of all evil eyes. To be able to provide a reasonable level of comfort in this aspect, the security program of the banks will have to be dynamic and alive to the imponderables.
• Acceptance by the staff and changing their mind set to accept technology and a role shift will be a very big challenge for managements

As the benefits outweigh the risks and as other major private sector banks started off from

➢ **HWAK (The Intelligent Auto-teller and Netware Management System)**

Intelligent auto-teller systems are a special breed of auto-teller machines capable of thinking for themselves, that means they are fast, impose less demands on your banking systems and serve the customers more like a personal banker than less sophisticated auto teller systems. HWAK provides unsurpassed service even without benefit of a reliable communication network.

✓ **Benefits of HWAK are:**
  a. Customer satisfaction.
  b. High availability
c. Online and offline auto-recovery

d. Anytime full banking service

e. Low cost, shorter queues and less number of tellers with ease of use.

f. Quick and early implementation

g. Enhanced security and audit control

h. Network management

i. Predictable cost of ownership

j. Comprehensive 'One Stop' auto banking.

➢ ELECTRONIC DATA INTERCHANGE (EDI):

EDI is a computer-to-computer transfer of details of commercial or administrative transactions using an agreed protocol and standard data structure. EDI standards have been developed in respect of specific messages for transmission of business transactions which are electronic equivalents of commercial invoices, purchase orders, transport bookings and payment instructions etc.

➢ ELECTRONIC FUNDS TRANSFER (EFT):

The use of MICR technology for processing of cheques was the first step towards the mechanization of the cheque clearing system, which later paved the way for introduction of EFT systems. A committee on mechanization of cheque handling, constituted by the 'American Bankers Association' introduced MICR in the year 1954.

In 1968, the Special Committee on Paperless Entries (SCOPE) was set up in the USA to examine the concept of an automated clearing house. As a result in 1972, the first Automated Clearing House (ACH) started operating. Since then there have been rapid strides in the automated clearing house operations, the world over. With the extensive expansion of reliable communication systems, POS systems also came into existence in the 1970s. Another significant development during the period was introduction of SWIFT. By this time, banks started using networked systems and ATMs. The final development in the EFT system has been the private card systems like 'Visa Card', which employs an alternative payment system. The widely adopted definition of EFT is given by the Section 105(5) of the Article 4A of the Uniform Commercial Code (UCC) of the USA. Funds transfer systems means a wire transfer network, automated clearing house and other communication system of clearing
house or other association of banks through which payment order by a bank may be transmitted to the bank to which the order is addressed.

In this context, the EFT takes two forms - credit transfer or debit transfer. EFT system, as a means of real-time funds transfer mechanism is now a well-established concept in all the developed countries.

The wire transfers, ATMs, cards have become the largest facilitators of EFT. Real time gross settlement system and cheque truncation is a landmark in the field of EFT system in India.

In India the system is hosted and operated by the RBI, permits transfer of funds, unto Rs. 5 lacs from any account at any branch of any member bank in any city to any other account at any branch of any member bank in any other city. This system utilizes the Service Branches of the member banks and the nodal offices of RBI. RBINET is the conduit for the flow of funds. The Reserve Bank of India acts as the service provider as well as regulator. A special EFT (SEFT) was introduced in April 2003 covering about 3000 branches in 500 cities. This has facilitated same day transfer of funds across accounts of constituents at all these branches.

**NATIONAL ELECTRONIC FUND TRANSFER SYSTEM (NEFT):**

With the availability of integrated technology consisting of computers and communication facilities, distances no longer remain a constraint in providing better customer service and expediting the funds transfer mechanism. EFT facilitates quick movement of funds through electronic media. EFT mechanism involving inter-bank funds settlement at the national level has come up only recently as an aftermath of the recommendations of the Saraf Committee on technology issues in the payment and settlement system constituted by the RBI in 1994. The basic infrastructure at various branches/offices, at present, however is not capable of supporting such system, which is dependent upon sophisticated communication systems integrated with computers. Due to these factors, the EFT system introduced by RBI is largely built around the existing infrastructure for cheque clearing. The Saraf Committee had suggested a hybrid system, both paper and electronic media for message transmission. It had suggested that high value institutional funds transfer should be batched every hour. The batch system has since been
implemented in 1996. The RBI acts as the service provider as well as the system regulator.

Reserve Bank of India has introduced a system called ‘The Reserve Bank of India National Electronic Funds Transfer System’ which may be referred to as ‘NEFT System’ and shall include the set of procedural guidelines detailed hereunder, for the participating banks and institutions with the required computer system and communication network through which funds transfer operation would take place.

🔹 REAL TIME GROSS SETTLEMENT SYSTEM. ( RTGS )

- RTGS is an electronic payment environment where payment instructions processed on a continuous or Real Time basis, and settled on a GROSS or Individual basis without netting the debits against credits payments so effected are final and irrevocable settlement is done in the books of central bank – the ultimate liquidity depository of the country. RTGS uses the INFINET and SFMS.

- Each bank will be having a single gateway interface called participant interface or ( PI ) for the RTGS system. The payment message / enquiry / clearing settlement originates from the participants host system. ( Branch / Treasury )

- The message is passed on by the participant and clearing system interface ( PI ) to inter bank funds transfer processor ( IFTP ), which acts as a broker. Communication between the PI and RTGS systems will be through IFTP only and not directly.

- IFTP stores the message and in case of payment messages construct settlement message containing a core subset of the information required for settlement ( Settlement message ) and is routed to the RTGS system at RBI.

- On receipt of the subset, RBI checks whether the sending bank has sufficient covering funds in the account and informs the IFTP of the status of transfer, queued or settled.

- The settlement message is processed and finalization is advised to IFTP.

- Based on response, IFTP enriches the message received from RTGS system by adding back the corporate details and sends settlement advice to both the
originating and beneficiary participant in case of successful settlement or failure advice to the originating participant in case of failed settlement.

- Thus, the business information, which is exchanged between sending and receiving bank, is not known by settlement agent.
- Thus, the RBI acts as only a settlement agent.

➢ **ELECTRONIC CLEARING SYSTEM (ECS):**

   It is a mode of electronic funds transfer from one bank account to another using the services of a clearing house. This is normally for bulk transfers from one account to many accounts or vice versa. This can be used for making payments like distribution of dividend, interest, salary, pension, etc. by institutions or for collection of amounts for purposes such as house tax, water tax, etc or for loan installments of financial institutions/banks or regular investments of persons.

   There are two types of ECS called ECS (Credit) and ECS (Debit).

➢ **Advantages of ECS to the Banks:**

1. Banks handling ECS get freed of paper handling.
2. Paper handling also creates lot of pressure on banks as they have to encode the instruments, present them in clearing, monitor their return and follow up with the concerned bank and customers.
3. In ECS banks simply get the payment particulars relating to their customers. All they need to do is to match the account particulars like name, account number and credit the proceeds.
4. Wherever the details do not match, they have to return it back, as per the procedure.

➢ **ECS (Credit):**

   It is a new method of payment introduced by Reserve Bank of India which provides customers an option to collect their monthly/quarterly/half yearly/yearly interest/dividend/salary/pension directly through their bank accounts. The customer’s bank account would be credited through the new payment mechanism, on the due date. In this system payment instruction would be issued by the bank electronically through the banker to the Clearing Authority and the Clearing Authority
would supply credit reports to the bank with which customer maintains the specified account. The branch will credit the customer's account and indicate the credit entry as 'ECS' in his passbook / statement of account. Individual transactions without any monetary ceiling would be covered under the Scheme. If customer's maintain more than one bank account, payment can be received at any of these accounts. The Customer need not open any new bank account for the same. This would only be an additional mode of payment and would be optional. The Customer can have the right to withdraw from this mode of payment by giving an advance notice of 6 weeks.

Even the institutions having to make a large number of payments (such as interest / dividend) can directly deposit the amount into the bank accounts of the share-holders/ depositors/ investors without having to issue paper instruments.

Bulk and repetitive payments like interest/dividend are mostly paper based involving printing of warrants (in costly MICR format), dispatching them by post (most often by Regd. Post) and reconciliation thereof after payment by the agency banks. The difficulties are -

- It requires expensive administrative machinery for printing, dispatch and reconciliation.
- Bunching of a large number of instruments in clearing results in operational bottlenecks and pressures on the cheque processing system.
- Chances of loss of instruments in transit and their fraudulent encashment.
- The customer has also to keep track of the receipt / non-receipt of the instrument and take efforts in depositing the instrument to the bank on receipt of the same;
- Banks find processing of such a large volume of instruments not only error prone and monotonous, but also a strain on the cheque clearing system.

✔ Working of ECS Credit Clearing:

- **Step 1**: The corporate body institution (called "User") which has to make payments to a large number of customers / investors would prepare the payment data on a magnetic media (i.e., tape or floppy) and submit the same to its banker (Sponsor Bank).
• **Step 2**: The Sponsor Bank would present the payment data to the local Bankers’ Clearing House (Managed by Reserve Bank of India at 15 centres and by State Bank of India or Associate banks at other centres) authorizing the Manager of the Clearing House to debit the Sponsor Bank’s account and credit the accounts (Destination Bank) of the banks where the beneficiaries of the transactions maintain their accounts.

• **Step 3**: On receiving this authorization, the Clearing House will process the data and work out an inter-bank funds settlement.

• **Step 4**: The Clearing House will furnish to the service branches of the destination banks branch-wise credit reports indicating the beneficiary details such as the names of the branches where the accounts are maintained, the names of the beneficiaries, account type, account numbers and the respective amounts.

• **Step 5**: The service branches will in turn pass on the advices to the concerned branches of their bank, which will credit the beneficiaries’ accounts on the appointed date.

✅ **Benefits to a Corporate Body / Institutions**:

- Savings in administrative cost presently being incurred for printing of paper instruments in MICR format and dispatching them by Registered Post.

- Loss of instruments in transit or fraudulent encashment thereof totally eliminated.

- Reconciliation of transactions is made automatic. By the time the ECS cycle is completed, the user institution gets an electronic data file from its bank with the date of payment and banker’s confirmation thereon.

- Cash management becomes easier as arrangement for funds is required to be made only on the specified date.

- Ensuring better customer/investor service.

- Paying the way the best companies in the world pay to their share holders / investors, customers

✅ **Benefit to the beneficiary customer**:
• Payment on the due date
• Effortless receipt – No need for visiting the bank for depositing the dividend/interest warrant.
• Loss of instrument in transit or fraudulent encashment thereof and consequent correspondence with the company are totally eliminated

➢ ECS (Debit):

In this scenario, the Reserve Bank of India has implemented an off-line electronic funds transfer system allowing paperless direct debit and credit transactions by banks, viz. Electronic Clearing Service. After successful implementation of ECS-Credit scheme, Reserve Bank of India initiated the ECS-Debit, a facility of payment of preauthorized debits through ECS. ECS Debit Clearing Scheme approved by Committee on Technology Issues in Banking Industry (Payment System and Cheque Clearance System) under the chairmanship of Shri W.S. Saraf, the then Executive Director, Reserve Bank of India, was introduced. This ECS allows customer to pay their monthly / quarterly / half-yearly / yearly utility bills like telephone, electricity, loan installments, insurance premium etc directly through their bank accounts. The Customer’s bank account would be debited through the new payment mechanism right on the due date. The Customer would be advised in the usual manner to pay the bill. The Payment instructions would be issued electronically through our banker to the Clearing Authority and the Clearing Authority would supply debit reports to the bank with which customer maintain the specified account. The branch will debit the customer’s account and indicate the debit entry as ‘ECS’ in customer’s passbook / statement of account. If the customer maintains more than one bank account, payment can be received from any of these accounts. The customer need not open any new bank account for this purpose. This would only be an additional mode of payment and would be optional. The customer would have the right to withdraw from this mode of payment by giving an advance notice of 2 weeks. The customer’s complaint, if any, would be immediately dealt with and in that situation the bank assures the customer to give a reply within 15 days.

ECS payment can be initiated by an institution who have to make bulk or repetitive payments to a number of beneficiaries. They can initiate the transactions
after registering themselves with an approved clearing house. ECS users have also to obtain the consent as also the account particulars of the beneficiary for participating the ECS clearings. The ECS user's bank is called as the sponsor bank under the scheme and the ECS beneficiary account holder is called the destination account holder. The destination account holder's bank or beneficiaries bank is called the destination bank.

The beneficiaries of the regular or repetitive payments can also request the paying institution to make use of the ECS (Credit) mechanism for effecting payment. The ECS users intending to effect payments have to submit the data in a specified format to one of the approved clearing houses. The list of the approved clearing houses or the list of centres where the ECS facility has been provided is available at www.rbi.org.in. The clearing house would debit the account of the ECS user through the account of the sponsor bank on the appointed day and credit the accounts of the receipts banks, for affording onwards credit to the accounts of the ultimate beneficiaries.

✓ Working of ECS (Debit):

- Utility Companies, banks / institutions receiving periodic / repetitive payments towards electricity bills / telephone bills / loan installments / insurance premia initially collect mandates from their customers / subscribers for collection of amounts due from them by direct debit to their accounts with banks. The mandate provides details such as the name, account number, name of bank / branch etc. duly certified by the bank concerned.

- Based on the details furnished in the mandates, the user company prepares transaction data on electronic media and submits the encrypted data to the local Clearing House, through its Sponsor bank.

- After due validation of the data, the local clearing house processes the same and arrives at the inter-bank settlement as also generates bank-wise / branch-wise reports (hard copies).

- NCC debits the destination banks' accounts with clearing house and simultaneously affords a consolidated credit to the sponsor bank's account and

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furnishes the bank-wise and branch-wise reports to the service branches of destination banks.

- Service branches forward the branch-wise reports to the respective branches for debiting the accounts of customers with the indicated amounts.

✓ **Benefits under ECS (Debit)**

- Faster Collection of bills by the companies and better cash management by them.
- Eliminates the need to go to the collection centers / banks by the customers and no need to stand in long ‘Q’ s for payment
- Automatic debiting to the accounts once the mandates are given by the customers, to that effect cuts down the procedural delay

### 3.6 TECHNOLOGY IN BANKING:

In modern times, technology has become critical for survival of business organizations. Banks are no exception to this and therefore it is necessary to give better and quick services to customers.

Technology can contribute significantly towards achieving this quickness. There is a trend towards multimedia banking because it offers several advantages as compared to traditional banking such as convenience, facilitating electronic bill payment system etc. For example, ATMs have freed the customer from having to stick to the rigid bank timings as an ATM is available all day and night. Today we talk in terms of virtual branches or multimedia banks. A bank branch can be set up on the Net. A depositor can view his account, he can order cheque-books and go through the services offered by the bank without having to go to the bank. In the case of some banks the offices are linked via satellite allowing the customers instant access to all their branches. Banking today is about technology based access to the retail customer.
at minimum effort and cost. Technology is not an option but a necessity in banking.

In this chapter we shall explain the use of technology in banking.

- CREDIT CARD

Credit Card

The plastic credit card with a magnetic strip many people carry in their wallets or purses is the end result of a complex banking process. Holders of a valid credit card have the authorization to purchase goods and services up to a predetermined amount, called a credit limit. The vendor receives essential credit card information from the cardholder, the bank issuing the card actually reimburses the vendor, and eventually the cardholder repays the bank through regular monthly payments. If the entire balance is not paid in full, the credit card issuer can legally charge interest fees on the unpaid portion.

Individual banking institutions have their own policies when it comes to credit card applications. Customers may seek either a secured or unsecured credit card, depending on their individual repayment histories (credit rating). A secured credit card requires the applicant to deposit an amount of cash equivalent to the credit limit desired. A deposit of $1500 USD, for example, should be enough to be issued a credit card with a $1000 to $1500 spending limit. If the customer fails to make sufficient payments, the deposited money will be used to satisfy the credit card debt.

An unsecured credit card, on the other hand, is generally issued to those who have a good credit history and have demonstrated an ability to repay the accrued debt on time. Credit limits are determined on an individual basis, and may be raised or lowered based on performance. An unsecured credit card is essentially a pre-approved loan, with interest rates higher than a similar personal bank loan. The main benefit of
would be the ideal solution; the borrower could repay the balance with his or her first paycheck and few interest charges would accrue.

Credit card use often becomes problematic when the holder accrues more debt than a regular monthly payment can cover. The issuing bank does allow credit card users to carry over balances every month, but significant interest rates may also accrue on those balances. Missing a scheduled payment can also prompt the bank to raise interest rates on a delinquent account. If a credit card holder can only afford to pay the minimal amount due every month, he or she will not be reducing the actual debt incurred. The minimal payments may only apply to the accrued interest. This is a financial spiral many credit card users may experience if they don't use proper spending restraint.

A credit card does give the holder an immediate credibility for services such as hotel reservations, car rentals and airline ticket reservations. Those without a credit card often have to guarantee their reservations with cash deposits or several forms of identification. Many credit card plans also include insurance coverage for theft or fraud. If a credit card is reported stolen and then used illegally, the cardholder would not be held responsible for unauthorized charges. A credit card holder can authorize other people to use the card for purchases or services, however. Ultimately, the primary cardholder is responsible for all charges placed on his or her account.

A credit card is not a requirement for successful living, but even those who only pay for goods or services with available cash often find a credit card to be a convenient form of identification and instant credibility. In order to avoid excessive credit card debt, the holder must decide if the goods or services are worth the added expenses.

3.6.1 **Advantages of the Credit Card System.**

The advantages of credit card system to all those who are concerned are as under:

- **To the Cardholder:**
3.6.1.1 It is convenient for a cardholder to carry a credit card in his/her wallet and make payment towards travel or purchase. It allows the cardholder to draw cash too.

3.6.1.2 It inculcates a sense of financial discipline in them.

3.6.1.3 It provides a proof of purchase through banking channels to strengthen the cardholders' position in case of disputes with sellers etc.

- It also allows giving spending power to add-on members.
- It also extends additional facilities like insurance cover/discount etc.

3.6.1.3.1 **To the Banks**:  

- Scope & potential for better profitability out of share earned from the trader’s turnover.
- Helps in establishing banking relationship with new customers.
- This also provides additional customer service to the existing clients.
- Better network spread of cardholders and their increased use means higher popularity and image for the banks.
- Savings of expenses on cash holding / stationary printing and manpower to handle clearing transactions.

✓ DEBIT CARD (13)

Visa International Debit Card

A debit card is a plastic card issued by banks to customers. The card allows instant purchase, removing the correct balance from the user’s attached bank account.
Debit cards are distinct from credit cards in that they allow purchase based on available funds in the account to be deducted immediately, instead of by using a line of credit that can be repaid at a later time.

Most debit cards have two features: the ability to purchase items at stores that have automated debit or credit card machines, and the ability to withdraw cash from your bank account at an ATM. They are available in most countries of the world, and have nearly supplanted the use of checks in the United States. However, the cards possess many dangers to the user, both in terms of possible identity theft and unexpected bank fees.

Most forms of debit card require a personal identification number (PIN) as a security feature. When removing money from an ATM or using an automatic purchasing machine at a store, the user will have to enter their PIN for verification. In online purchases, the PIN is usually not required, but users will often need to enter the three or four digit security code listed on the back of the card. Additional safety measures common for debit cards include a photograph of the card’s owner on the front, or an electronically reproduced customer signature imprinted on the card.

While the security features hold up well for in-person transactions, they leave debit card users vulnerable for online theft. If a thief steals your wallet, they will likely have all of the information they need to use your debit card for Internet transactions. If you have a dual credit / debit card, they may also be able to use it in stores that do not require a PIN for credit use. If you discover your card missing, or notice suspicious charges to your account, contact your bank immediately.

Another peril debit card users face is accidental charges. If you have a two or more linked bank accounts, such as checking and savings, you may sign up to have money transferred from one to the other in case of overdrawing your account. Read the fine print carefully, however, as some banks charge an overdraft fee of up to $20 US Dollars ( USD ) for each transfer of this kind. Banks may also set a limit of daily, weekly or monthly transactions you can use your debit card for. Exceeding this limit can also result in serious charges to your account.

Rules regarding the use of debit cards vary from country to country and can impact their popularity. In India, the merchant can be charged for each transaction involving a debit purpose, leading to many shops banning their use. A few countries or banking networks charge customers a transaction fee each time they use their debit
card. In most nations, the cards are freely and widely used for all types of transactions. Studies suggest that in Canada, New Zealand and the United States, debit cards have or will soon overtake cash as the most common form of payment.

3.6.2 **Salient features of debit cards:**

a) Works like a passbook withdrawal, thus withdrawals more than that of available balance in the account of the customer are not allowed.

b) No credit loss to banks since the system works on available funds in the customers' account.

c) It is a paper-less system of payment, i.e. no paper money or cheques are required.

d) Payees and/or member establishments are sure of payments, as the system operates only upon the debit to account of the payee.

e) No transaction costs to customers.

f) Since the payments are directly debited from the account of payee, there is no late payment fees payable by payee nor there any interest earnings for banks as there is no credit involved.

g) Zero-risk weightage on debit cards as compared to credit cards where the same has a 125 per cent risk weightage.

✓ **CHEQUE CARD:**

It is a card given by the bank to the customer that he shows when he writes a cheque which promises that the bank will pay out the money written on the cheque. Under 'Cheque cards' system, card-holder is given a card and a cheque book. He has to use the cheques, while the purchases are made and the trader gets guaranteed payment, customer does not get free credit, he has to keep sufficient balance in his
account or the bank will provide overdraft up to a specified limit on an interest payment basis.

✓ **SMART CARD**

With the use of credit cards, we may avail of credit facility on our purchase of goods / services from approved sales outlets. A smart card however, enables the card holder to perform various other banking functions apart from credit purchases. For example, with smart cards, we can withdraw cash from ATMs, we can verify entries in our accounts, seek information pertaining to our accounts, etc. This is possible because the card has an integrated circuit with micro process chip embedded in the card for identification purposes. The card can also perform calculations and maintain records.

![SMART CARD](image)

✓ **ATMs (Automated Teller Machines)**

An ATM is an electronic machine, which allows user to withdraw and deposit cash, pay bills, request for a statement and other banking transactions. An ATM is today’s most preferred delivery channel. ATMs allows you to do the banking transactions such as cash withdrawal, cash deposit, checking balance, enquires, fund transfer, printing statements of account, cheque deposit, request for cheque book using a plastic magnetic strip card and personal identification number issued by the financial institution. Now, most of the banks have their ATM outlets in India. Private sector banks have taken a lead in this. Indian banks have come up with Swadhan Shared Payment Network System (SPNS) scheme, where banks can use each others ATM. Swadhan is registered trademark for electronic banking services, owned by
Indian Banker’s Association (on behalf of members of Swadhan SPNS). Swadhan network went live on 1st Feb. 1997, with 4 ATMs of 4 banks. Originally the network was spread over the cities of Mumbai, Vashi and Thane which were connected to the central host. From 1st July 2000 the network has expanded to connect ATMs all over India. The banks who are members of the Swadhan network, issues cards to it’s customers for transacting on the Swadhan network. Under the Swadhan scheme, the member banks enjoy the benefit of maximum ATM with minimum investment. Also each member bank earns revenue in the form of acquiring transactions of the other banks card holders. ICICI and SBI, two big players in terms of ATM penetration in India have taken the decision to stay out of the scheme. The customer requires ATM card and ID number to gain access to the machine. Some ATM cards are also Debit Cards, which can be used in shops and super markets. The purchase amount is deducted immediately from the customer’s account. The use of ATMs is increasing by the day. ATM offers the following services:

✓ Cash transactions from the customers account.
✓ Extended hours services i.e. 24 hours transaction facility available.
✓ Provides the account information and printing the statement of accounts.
✓ Depositing of cheques
✓ Request for cheque book, standing instructions and statement of accounts.

With the help of ATMs, the customers can easily access their account, day and night, weekends or holidays. The customers are happy with this service because of privacy in the transaction and again there is no need to wait in a queue for any single transaction. ATMs can be placed at any convenient location in the city. Customer can access their account from any ATM center of their bank. An ATM provides an error free transaction to the customer and flexibility in withdrawals. IT implementation has affected almost all areas of the banking industry, namely products and services for customers, delivery channels like – ATM, branches, call centers, Internet Banking, MIS, Customer correspondence with other banks, entities and back office function. With the help of step by step technological development, from back office application to core banking solutions, now the banks have reaped the benefits of advanced computerised transactional systems.
CHEQUES can be encashed across the counter through the teller system. In many banks, this facility is available to customers so that the encashment of cheques can be expedited. It is a convenient and time-saving system. There are two systems of this type:

1. Instant payment / receipt system and
2. Prompt payment / receipt system.

In the instant payment / receipt system the counter clerk is authorized to receive cash and make payments up to limited amounts without reference to any ledger balances (unless he has a doubt) or specimen signatures since the counter clerk is expected to possess knowledge of the customers' accounts allotted to him as also the customers' specimen signatures and accordingly, he is authorized to make the payment.

In the prompt payment receipt system, the customer's accounts and specimen signatures are maintained in duplicate. One set is with the ledger keeper and the other with the counter clerk.

The teller system does have an element of risk but it is also convenient for the customers.
With computerization of branches of many banks, the teller is authorized to make payments directly after verifying the signatures thereon. Payments can be, therefore made more promptly in a few minutes.

> **MICR CLEARING (Magnetic Ink Character Recognition):**

MICR is a character recognition technology adopted mainly by the banking industry to facilitate the processing of cheque. The process was demonstrated to the American Bankers Association in July 1956, and it was almost universally employed by 1963. MICR characters are printed with a magnetic ink or toner. Magnetic printing is used so that the characters can be reliably read into a system. In India MICR was introduced in 1987 in the four Metros, the MICR Clearing is now in operation in 10 centers (Hyderabad, Bangalore, Ahmedabad, Kanpur, Jaipur, Nagpur, Baroda, Pune, Gauhati, Trivandrum) and is proposed to be extended to a total of 22 centers where volume of clearing transactions is large.

> **CHEQUE TRUNCATION SYSTEM**

Truncation is the process of stopping the flow of the physical cheque issued by a drawer to the drawee branch. The physical instrument will be truncated at some point en-route to the drawee branch and an electronic image of the cheque would be sent to the drawee branch along with the relevant information like the MICR fields, date of presentation, presenting banks etc. Thus with the implementation of cheque truncation, the need to move the physical instruments across branches would not be required, except in exceptional circumstances. This would effectively reduce the time required for payment of cheques, the associated cost of transit and delay in processing, etc., thus speeding up the process of collection or realization of the cheques.

Cheque Truncation speeds up collection of cheques and therefore enhances customer service, reduces the scope for clearing related frauds, minimizes cost of collection of cheques, reduces reconciliation problems, eliminates logistics problems etc. With the other major product offering in the form of RTGS, the Reserve Bank created the capability to enable inter-bank payments online real time and facilitate corporate customer payments. The other product, National Electronic Funds Transfer, is an electronic credit transfer system. However, to wish away cheques is simply not
possible and that is the reason why the Bank decided to focus on improving the efficiency of the Cheque Clearing Cycle. Cheque Truncation is the alternative. Moreover contrary to perceptions, Cheque Truncation is a more secure system than the current exchange of physical documents in which the cheque moves from one point to another, thus, not only creating delays but inconvenience to the customer in case the instrument is lost in transit or manipulated during the clearing cycle. In addition to operational efficiency, Cheque Truncation has several benefits to the banks and customers which includes introduction of new products, re-engineering the total receipts and payments mechanism of the customers, human resource rationalization, cost effectiveness etc. Cheque Truncation thus is an important efficiency enhancement initiative in the Payments Systems area, undertaken by RBI.

**Solution Overview**

CTS is capable of capturing the data and images of the cheque as per RBI guidelines. At the same pass, it also endorses the index (a Unique Identifier - UI) or other configurable characters on the rear of the physical items.

CTS can be easily configured to perform various basic yet essential validations of the items during the point of capture. Validations such as valid bank - branch codes, cheque number, check digits (if any) and many other fields can be easily included.

**KEY FEATURES :**

- Simple and user-friendly graphical user interface.
- Support various scanners like Canon, Teller, Unisys, etc.
- Bitonal Front & Back, Grey scale images
- Automatic encoding and endorsing
- Automatic CAR/LAR extraction capability through sophisticated ICR engines
- Extensive Search Options for items captured
- Data file encryption before transmission to service branch/Clearing House
- Inline Image Quality Assurance (IQA) and Image Usability Assurance (IUA) capability
- Unique transaction follower procedure to identify status of cheques presented
- Outward returns re-presentment batch runs
• Better reconciliation and fraud prevention
• Basic reports
• Role based access administration
• Feature to track the productivity and efficiency of the user
• Enables user to avoid duplicate MICR cheques
• Enables high productivity because of its easy to use feature
• Archival component responsible to clean the application and store data and image for future enquiry and report generation.
• Customer Relationship Management for Priority and High Net-worth Accounts by watching out for Cheque returns from Central Inward Processing Centre and alerting the Relationship Managers (RMs).
• Alerting and prompting action of RMs on cheques returns due to insufficient funds.
• Email and SMS alerts to RMs on transactions of Accounts of their interest
• MIS Reports
• Flexibility to support different Architectures, such as:
  ✓ De-centralized
  ✓ Centralized
  ✓ Hybrid

➢ Interfaces :

CTS interfaces with variety of systems both internal and external to the Bank ;
• Clearing House
• Core Banking System by online and batch uploads
• Credit Card Management System
• Cash Management System
• Signature Capturing System
• Electronic Clearing System
• Optical Character Recognition (OCR) Engine
• Dividend - Warrant Management System
• Cheque Deposit Machine

➢ Security :

The cheque truncation system is protected by comprehensive PKI-based security architecture. On top of the PKI technology, the security architecture also
incorporates basic security and authentication controls such as dual access control; user ID and passwords with cryptobox and HSM (Hardware Security Machine).

➢ **Benefit Of Cheque Truncation To Customers Of The Bank** : (18)

With the introduction of the imaging and truncation, the physical movement of instruments would be stopped and the electronic movement of images of cheques would speed up the process of settlements and ultimately alter the clearing cycles. The clearing cycle could be shortened and it would be possible for customers to realize the proceeds of cheques early. Thus cheque truncation would reduce effectively the time of float, i.e. time from the point of issue of cheque to the point of time the actual debit takes place. In case such clearing is introduced across the cities, it would ensure the realisation of inter-city instruments faster thus ensuring early availability of funds to beneficiaries.

Thus the benefits could be summarized as:

1. Faster clearing cycle.
2. Better reconciliation / verification process.
4. T+0 for Local Clearing and T + 1 for inter-city clearing.
5. Elimination of Float & Incentive to shift to Credit Push payments.
6. The jurisdiction of Clearing House can be extended to the entire country
7. No Geographical Dependence
8. Operational Efficiency will benefit the bottom lines of banks – Local Clearing activity is a high cost no revenue activity.
10. Reduces operational risk by securing the transmission route.
Cheque Truncation System Process Flow

The CR-55
Lightweight, compact cheque scanner
Detected double feeding, handles multiple cheque types
Scans 24cpm in colour with a 99.9 per cent MICR reading ratio

Identification of CTS 2010 Standard Cheque:
1. Bank/branch address along with IFSC code printed on the top left corner of the cheque.
2. Standard date format.
3. Printer name along with 'CTS 2010' printed on the extreme left of the cheque.
4. Axis Bank logo on the centre of the cheque.
5. 'Please sign above' is mentioned on the bottom right corner of the cheque.

How to identify CTS 2010 Standard Cheque?
- Bank/branch address along with IFSC code printed on the top left corner of the cheque.
- Standard date format.
- Printer name along with 'CTS 2010' printed on the extreme left of the cheque.
- Axis Bank logo on the centre of the cheque.
- 'Please sign above' is mentioned on the bottom right corner of the cheque.
3.7 **GLOBAL TRENDS IN BANKING SYSTEM**

Globally, the banks are recognizing the need to embrace technology in the area of products and services to compete successfully in the years ahead. In fact, the commercial banks, the world over, are amongst the largest consumers of information technology. The banks perceive the future of the financial services industry as becoming heavily dependent on electronic delivery mechanism and are working towards bringing banking right into their customer’s home.

Not only at the global level, but also in India, Real Time Gross Settlement (RTGS) system has been thrown open to customers. In fact, the general belief is that the absence of these services could affect the bank’s ability to retain critical segments of their customer base. However as a strategy most of the banks are targeting home banking facility at the top ten to twenty percent of bank’s customers that deliver eighty to ninety percent of the bank’s profits, and as such, are investing heavily to develop and market high – tech services.

There has been a noticeable tilt towards technology driven products and services. Following trends are visible in the banking systems;

1. Most of the banks are installing more and more ATM’s for banking transactions.
2. To give the customers more choices for collecting their cash, the banks are resorting to have non-traditional branches such as supermarkets and video kiosks.
3. Telephone banking and debit cards are finding increased acceptance of the customers. Credit cards also find a significant usage.
4. The smart cards are currently offered by only a very few of the banks, but almost all the banks plan to offer these in the future.
5. PC banking is another service which is finding wider acceptance.
6. Banks are tapping new sources of revenue and finding ways to differentiate themselves from other banks and non – banks and are increasingly venturing into the fee- based services like the;
   - Marketing of insurance and annuity (yearly grant or allowance) sales.
   - Mutual funds.
   - Financial Planning.
   - Trusteeship Services.
Additionally the following activities are also finding technology as an able ally:

1. Automated clearing systems.
2. Customer Information Database.
3. Online access to regulatory agencies.
4. Use of the internet and mobile for customer services.
5. Real Time Gross Investment (RTGS)
6. Cheque Truncation.

Another impact is in the globalization of banking services. Large banks are shifting their focus away from the domestic market to the global arena, pursuing global expansion, and emphasizing those products and services that are globally oriented.

Technology, currently being developed and tested, range from a new generation of more sophisticated stored value and smarter smart cards, to the execution of commercial transactions over the internet. An alternative form of e-cash will soon develop which does not require a traditional paper oriented payments by using technologies that will enable such smart cards to transfer value through the internet.

The technology has also found many other practical uses in Europe and Canada. Certain banks are facilitating banking transactions through smart phones, which are sophisticated electronic devices that can also deliver e-mail, carry out home shopping and home banking. These phones have a built in credit card reader that provides access to these facilities. Banks are using digital signatures for more secure banking transactions. The advances in technology will also have dramatic effects on the payment systems. Globally the banks are poised to use technology that will gradually give new dimensions to the banking products, services and delivery systems.

4 Impact Of Information Technology On Banking Sector

Under the impact of technology, the organization structure of the banks, the role of various functionaries and the approach of banks to customer needs are undergoing a perceptible change. The technology has helped the banks to strategically
look at customer needs to offer newer and more efficient banking services, at the same time gearing its staff to cope with the stresses of technology.

Here, we discuss the impact of information technology on the important components of banking, viz., the organization, the customers, the personnel and lastly the data. Data privacy, involving individuals’ rights and privileges about personnel information is a very sensitive issue being debated and examined, the world over.

**Change In The Organizational Structure And The Orientation.**

Informational technology is a means for increasing organizational productivity. IT, in fact, is much more than a series of new machines for organizational efficiency, since it brings about a new concept of self regulating systems and principles in the organization.

Some of usual changes brought about under the impact of IT relating to organizational structure and the orientation of the banking sector are as follows:

1. The need for faster information and better control has a direct impact on reducing hierarchical tier systems in the banks. This has resulted in establishing a direct liaison (communication or co-operation) between the top management and the field functionaries.

2. As the technology helps in collection, processing, interpretation and transmission of information, the need for middle tiers of management vanishes and more of self-managing groups with autonomy and access to information emerge strongly.

3. The management processes and the controlling mechanism characteristics also undergo a change. The decision maker needs to be vested with greater powers to cope with the stresses of time factor. Several traditional jobs no longer remain relevant and several new jobs come up.

4. Managerial attitudes also undergo a change under the impact of IT. This is reflected in the way the top executives look at IT as a functional requirement and apply it for improving organizational efficiency and effectiveness.

5. The organizational change can facilitate the increased involvement of information systems in the mainstream product offerings in the banking and
financial sector. In addition, to these technical and organizational changes, a psychological repositioning of the information technology function takes place.

6. In addition to the changes in organizational structure and orientation, the operating procedures also witness a direct impact of the IT. The systems and procedures within banks have to adapt themselves in accordance with the IT needs without sacrificing secrecy and security.

Impact Of IT On Service Quality.

Banking, which is primarily a service industry, has been, over the years becoming more and more technology dependant. The most visible impact of technology is reflected in the way the banks respond strategically for making its effective use for efficient service delivery. This impact on service quality is as follows:

1. Small and relatively new banks with a limited network of branches become better placed to compete with the established banks, by integrating IT in their operations. Technology is helping the banks irrespective of their size to have a level playing field for pricing their products.

2. The technology has helped in commoditizing some of the financial services. The technology is forcing the banks to develop a strategy for an on-line delivery system to broaden the customer relationship and to retain the customer loyalty.

3. The depersonalization can have a negative effect on relationship banking. The advent (important arrival) of home Banking fast changes the banks into shopping malls. It is an established fact that the human interface is the most vital aspect of any service industry, irrespective of how advanced the adopted technology is.

4. The advent of IT democratizes the information in the sense that bank customers, particularly the corporate customers, have access to the same real time information over which the banks earlier had control. This results in greater competition for the banks. Another competition to the banks stems from the advent of non-banking financial institutions who, armed with technological capabilities, are vying (Part of) with the banks to capture their retail customer base. The advent of virtual banking in the form of internet banking will remove
barriers for entry of these non-banking financial institutions to compete with the conventional banks.

5. In banks, the technology pushes the delivery of services out of the bank and the focus shifts from cost reduction to maintenance of market position. However, when properly adopted, the technology helps in accelerating the service delivery to customers providing control over account relationships.

➢ **CHANGES IN CUSTOMER ASPIRATIONS (AMBITION OR DESIRE):**

Today, the customers are demanding fast, accurate and reliable services. The customers expect a reasonably high standard of services. The absorption of technology, therefore, becomes inevitable for the banks to enable them to respond to customers’ needs at all times and at competitive prices.

In the changed socio economic conditions, the customers, individuals or corporate, no longer want to be restrained by the physical place where their funds and information are stored and wish the banking facility to come to their home/business place rather than in branches of banks. This has given rise to the concept of “Anywhere Banking” facility which offers access to banking services at a place and time convenient to the customers.

The use of improved telecommunication technology like leased lines, VSAT, etc, has made unhindered information flows possible in real time, on-line, and industry wide.

However the facilities provided by the banks increase, so does an increase in the demands of the customers. The business compulsions, steered by telecommunication breakthroughs, are putting tremendous pressures on individual banks to continuously evolve newer technique, for making business transactions better, faster and more efficient than that of others. In fact, the technological prowess of the banks and other financial institutions are likely to determine the future of how money and financial information will be transmitted for satisfaction of customer needs.

➢ **IMPACT OF IT ON HUMAN RESOURCE:**

Information Technology has improved the efficiency, innovative products and effective delivery systems for the banks to help them succeed in the marketplace. In
fact, the emergence of new players in the financial sector has brought home the hard reality that computerization, as an exercise for modernization, is now not a member of choice but has become a need for survival in the competitive environment and the bank employees have no choice but to accept it or be left with the prospects of total organizational decay. The technology has also brought about a visible impact, as discussed below on the human resource, which is the most vital component in the banking business.

1. The foremost impact of technology on the existing manpower is manifested in the resistance to the new systems. Such resistance is not unique to the banking industry, but stems from the basic instinct in human beings to view any change with an element of suspicion. The fear of change gives rise to anxieties, inhibition and skepticism, which can be overcome only with the spread of awareness at all levels.

2. Technology, when introduced in a planned manner, results in enhanced productivity with better placement of employees. With the increased use of information technology, there is an ever increasing demand of the specialized personnel in the field of IT management.

3. Another impact of IT on human resources is the high turnover rate of computer skilled manpower. This may necessitate the banks to formulate their own manpower policies to retain these professionals within the organizations.

In a nutshell, the application of IT affects the functional responsibility of every individual involved in the organization and proper training will help in preparing them for this transition.

➤ **IMPACT OF IT ON PRIVACY AND CONFIDENTIALITY OF DATA**

The concern for the misuse of the stored data becomes more profound when the stored data pertains to financial transactions of individuals. Customers feel threatened about the inadequacy of privacy being maintained by the banks with regard to their transactions and look at computerized systems with suspicion. Whereas inadvertent disclosure may occur when a system crashes and the contents of a user’s files get publicly displayed at a terminal, the serious problem is that of unauthorized disclosures when a person having access rights uses the data for unintended purposes.
Therefore, data privacy assumes two significant dimensions, viz.,

- The authority to access data.
- The authority to use data only for specified purposes.

The following principles are broadly common in the privacy laws:

1. The individual should be able to discover the existence and ownership of automated personal data systems and infer whether information about them exists in a system.

2. The data about individuals which is held for processing must have been obtained fairly for a specific lawful purpose only.

3. The data must be accurate, up-to-date and kept no longer than necessary.

4. The data collection on some individual attributes like racial origin, political, philosophy, religious views, sex life details, etc., should be prohibited.

5. Special measures over and above the normal computer security procedures should be taken to preserve the privacy of personal data.

6. Data must be used only for the specific purpose and may be disclosed in accordance with the specific purpose only.

With the adoption of information technology by the banks, the issue of data privacy becomes more relevant particularly in the context of transactions carried through the electronic funds transfer systems and settlement taking place through the RTGS system.

### 3.8 ELECTRONIC CLEARING SYSTEM IN INDIA

The RBI has introduced a special variant of EFT in the form of ECS, which is an upgradation of the paper-based payment system. Due to the absence of infrastructure, the processing is not entirely based on the principles of EFT. It combines:

- **Electronic Credit Clearing**: It was launched by the RBI in 1995, to provide an alternative to bulk payment transactions passing through the clearing houses which has greatly obviated the need for issuing large number of paper-based instruments. This system facilitates the transactions which has single debit and multiple credits. The details of the transactions are furnished on magnetic media for processing and the banks are getting credit data on magnetic media duly.
encrypted.

- **Electronic Debit Clearing**: This payment system works on the principles of multiple debits and single credits. The consumers willing to participate in the scheme, give a mandate to debit their account on receipt of a debit clearing advice from the debit clearing system and the subscriber has an option to indicate a maximum limit for each debit entry. In February 1997, the RBI introduced the ECS – RAPID (Receipt And Payment of Instrument / Document) in Mumbai for payment of service charges to the service provider from the consumers. In this system, a MICR reader captures the details of payment from a specially designed bill and the schedules are prepared on magnetic media for onward processing.

- **Floppy Input Clearing**: This is another mode of electronic clearing introduced by RBI in 1995, for the clearing house managed by it. The participating banks submit their inter-bank claim statement in electronic format on floppies. At the clearing house, this data is consolidated and the settlement statements are generated. This is more accurate and fast settlement process.

- **Information Technology And Banking Services In India.**

- **Technology: Changing Financial Service Provision**

  The introduction of IT sector has brought massive cost reductions in technology and communications cost. In particular, due to the use of internet following benefits are observed:
  - Reduces processing and labor costs
  - Allows for new distribution channel
  - Allows for better and more cost effective
  - Customer stratification and personalized pricing
  - Permits unbundling of financial products
  - Lowers the barriers to entry and enhances competition

- **Technology: Changing The Business Scenario**

  With the extensive use of computer and internet services the following innovative trends are observed in banking services.
Online Services

The clear trend is movement towards virtual transactions rather than physical. The Internet has impact on the financial services industry in a major way. Many new players — traditionally in non-finance are getting into the field and leveraging the World Wide Web. Further, delivery channels of financial services have proliferated and this has resulted in increased customer expectations.

The emerging trend is Electronic Bill Presentment Payment (EBPP) whereby the bank or financial services provider captures various bills utilities, insurance etc online and waits for online authorization from the accountholder to pay the same. Here the consumer does not get a physical bill as it is happening now. Everything is in electronic format.

Apart from the comforts offered to the consumer, EBPP results in huge cost savings for the service providers and some utilities in the US actually offer an incentive for switching over to the electronic mode of bill payment.

Account aggregation is yet another new trend that is becoming popular among foreign banks. Under this, a bank customer can transact or visit his favourite sites by just logging on to his bank's portal.

Bill Payment

Internet Banking is the most convenient channel to manage and pay the bills anytime. Banks tie up with other organizations across the country to facilitate payment of bills for Utility Companies (Electricity and Telephone) Bills, Bank credit card, Mobile Phone and Insurance Premium bills.
Shopping

Banks tie up with various organizations to facilitate online shopping for all its Internet Banking Customers.

Ticket Booking

Banks provide facility of online Railway / Air ticket booking, mobile phone recharging, etc.

Card-To-Card Funds Transfer

Card-to-Card Funds Transfer allows transferring money from your Bank account to any other Visa Debit or Credit Card, anytime, anywhere in India.

Share Trading

Banking products now allow online investment in Shares, Mutual funds, Derivatives (Futures and Options) and other financial products via cash trading, margin trading, and spot trading.

3.9 ADVANTAGES & DRAWBACKS OF IT IN BANKING

Technology driven banking: The entry of private sector banks has posed the challenge of competitive environment to the major public sector banks (PSBs). These private sector banks have brought with them the advanced banking technology which abbreviates delivery channels such as ATM, net banking, etc.

Some of the major advantages of using advanced technology are:

1. Faster processing and clearing of cheques using technology such as Magnetic Ink Character Recognition (MICR).
2. Customers can now withdraw money from their accounts at any time of the day and night using ATMs, not only locally but also from far off locations.
3. Providing various facilities like credit cards, debit cards, net banking, home delivery of cheque book etc, with opening of the accounts.
4. Providing core banking facility which has case of operations of the accounts from any branch of the bank.

5. Speeding up of money transfer from one account to another account in the branch of the same bank as well as different banks.

6. It is rare to find long queues in the banks as transactions like cash withdrawal are done through ATMs.

With the introduction of core banking solutions, banks thought that their worries were over. The causes of many of the complaints were removed with the new generation technology enabled products and services. However, the customer expectations also increased and a new set of complaints emerged. Some of these complaints were of different nature, which a banker could not have dreamt of.

➢ COMPLAINTS FROM THE CUSTOMERS:

1. **High service charges**: The investment and operating costs for new technology adopted by the banks are very high. Hence banks had to hike their service charges, some time charging for services which were till now provided free of cost to the customers.

2. **Hacking and stealing of data and passwords**: The complaints on account of stealing and misuse of passwords are on increase. While banks are moving towards secured sites for online transactions. Hackers are finding new ways to steal customer’s passwords and misuse them for the withdrawal of money.

3. **Failure of ATMs**: With the increasing number of ATMs installed by the banks, failure of ATMs is becoming a routine thing. Many bank ATMs are found cash starved particularly on holidays during the peak withdrawal season such as the pre salary days.

4. **Unsolicited Calls**: Banking has added into its fold new areas of business such as credit and debit cards, insurance, etc. The customers of such banks are literally harassed by the agents appointed for canvassing new business.

5. **Machine like attitude**: The earlier slogan, “Service with a SMILE” has now been replaced by “Service by a MACHINE”. Human beings working on the front computers are all computer screed glued. They have no time to look up and make an eye contact with their customers.
6. **Non issuance of Passbook** : It is a major problems encountered despite the RBI's instructions to all banks to issue passbooks when demanded by the customers. Many banks still continue to mail the statement of accounts periodically and are unable to provide its copy on demand to the customers.

7. **Ill informed call centers** : Unfortunately, the staff at these call centers lack basic banking knowledge and they are not in a position to answer a slightly different query which they have not been taught for.

**SUMMARY**:

Computers and communication technology has not only increased the competition among the financial institutions in general and the banks in particular, but have also opened new vistas for them to innovate themselves and come up with newer products and services. Globally, the trend is towards using computer technology for designing customer needs based products and services.

IT has a direct impact on the vital aspects of the banks. All the major components of a bank, viz., its organizational structure, the customers, the personnel and the data evolve under the impact of technology and react to the changes it brings about. IT has stiffened the competition and the banks have come out with newer products and service delivery systems. Training and retraining of staff and retention of highly specialized staff have become critical factors for banks for successful utilization of Information Technology.
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