CHAPTER -I

INTRODUCTION, REVIEW OF LITERATURE AND RESEARCH METHODOLOGY

An efficient financial sector is an engine for economic growth, development and progress of any country. It converts the fuel of savings into kinetic energy for the economy. The banking industry which is an integral subsystem of the financial sector has now taken the lead. There was a time when dwellers of the city alone enjoyed bank services but now bank offers access to even a common man and their activities extended to areas which were untouched. The reform process started in the 90's has given the industry a great opportunity. Not only the banking sector have become more efficient, it has also identified having growth opportunities and devised strategies to move savings into the growing sectors.

1.1 DEFINITION OF BANK

According to Encyclopaedia Britannica:

"Bank is an institution that deals in money and its substitutes and provides other financial services. Banks accept deposits and make loans and derive a profit from the difference in the interest rates paid and charged, respectively. Some banks also have the power to create money."

According to Indian Banking Regulation Act, 1949:

Banking is defined as “Accepting for the purpose of lending or investment of deposits of money from public repayable on demand or otherwise, and withdrawable by cheques, draft, and order or otherwise”.

The Oxford dictionary defines the Bank as:

"An establishment for the custody of money, which it pays out on a customer's order."
1.2 FUNCTIONS OF BANKS

The Reserve Bank of India has made certain policies, rules and regulations in order to set up working mechanism under which the bank functions, and are liable to provide requisite facilities or products for satisfaction of their customers. Functions of these banks are divided into the following three categories:

**Fig. 1.1: Functions of a Bank**

**PRIMARY FUNCTIONS**

Primary Functions of Banks are as under:

1) **Accepting of Deposits**

A bank accepts deposits from the public where they can deposit their cash balances in either of the following accounts to their convenience:

(a) **Fixed or Time Deposit Account**

In this category, an individual can deposit cash for a fixed period or time. The depositor gets receipts for the amount
deposited. It is called Fixed Deposit Receipt. The receipt indicates the name of the depositor, amount of deposit, rate of interest and the period of deposit. This receipt is not transferable. If the depositor stands in need of the amount before the expiry of fixed period, he can withdraw the same after paying the discount to the bank.

(b) **Savings Account**

This type of deposit is meant for those who just want to keep their small savings in a bank and might need to withdraw them occasionally. Banks provide a certain rate of interest on the minimum balance kept by the depositor during the month.

(c) **Current Account**

This type of account is kept by the businessman who is required to withdraw money every now and then. Banks do not pay any interest on this account. Any sum or any number of withdrawals can be done by such an account holder.

2) **Advancing of Loans**

The bank advances money in any one of the following ways.

(a) **Overdraft Facilities**

Customers of good trading are allowed to overdraw from their current account. But they have to pay interest on extra amount they have withdrawn. Overdrafts are allowed to provide temporary accommodation since the extra amount withdrawn is payable within a short period.

(b) **Money at Call**

It is the money lent for a very short period varying from 1 to 14 days. Such advances are usually made to other
banks and financial institutions only. Money at call ensures liquidity. In the Interbank market it enables bank to make adjustment according to their liquidity requirements.

(c) Loans

Loans are granted by the banks on securities which can be easily disposed off in the market. When the bank has satisfied itself regarding the soundness of the party, a loan is advanced.

(d) Cash Credit

The Debtor is allowed to withdraw a certain amount on a given security. The debtor withdraws the amount within this limit, interest is charged by the bank on the amount actually withdrawn.

(e) Discounting Bill of Exchange

It is another method of making advances by the banks. Under this method, banks give advance to their clients on the basis of their bills of exchange before the maturity of such bills.

(f) Investment in Government Securities

Purchasing of government securities by the banks tantamount to advancing loans by them to the Government. Banks prefer to buy government securities as these are considered to be the safest investment. For example: Indira Vikas Patra. It enables the banks to meet requirement of statutory liquidity ratio.

3) Credit Creation

One of the main functions of banks these days is to create credit. Banks create credit by giving more loans than their cash
reserves. Banks are able to create credit because the demand deposits i.e. a claim against the bank is accepted by the public in settlement of their debts. In this process the bank creates money. For this reason, Prof. Sayers has called bank “the manufacturer of money.”

4) **Cheque system of Payment of Funds**

A cheque is a negotiable instrument, which in fact is a bill of exchange, drawn upon a banker and is the most popular credit instrument used by the client to make payments. Cheque system is the main credit instrument in the banking world. Although a cheque is not legal tender money, this serves as a medium of exchange in a limited way as it is a negotiable instrument. Because of “clearing houses” and “clearing” operations of the banks, cheque can be and are used for transferring funds from one centre to another. In the modern days they can also be used for transferring funds from one country to another.

**AGENCY FUNCTIONS**

Banks act as agents to their customers in different ways:

1) **Collection and Payment of Credit**

The Commercial banks collect and pay cheques, bills of exchange, promissory notes, hundies, rent, interest etc. on behalf of their customers. Customers can leave standing instructions with the banker for various periodic payments ensuring the regular payments and avoiding the trouble of performing it themselves.

2) **Purchase and Sale of Securities**

The modern commercial banks also undertake the purchase and sale of various securities like shares, stocks, bonds units and debentures etc. on behalf of the customers. Banks do not give any advice regarding the suitability or otherwise of a security but simply perform the functions of a broker.
3) **Trustee and Executor**

Banks also act as trustees and executors of the property of their customers on their request. Sometimes banks also undertake income tax services on behalf of the customers.

4) **Remittance of Funds**

The Commercial banks remit funds on behalf of clients from one place to another through cheques, drafts, mail transfers etc.

5) **Representation and Correspondence**

Sometimes, commercial bank acts as representative or correspondent of the clients especially in handling various applications. For instance, passports and travel tickets, booking of vehicles, plots etc.

6) **Billion Trading**

In many countries, the commercial banks trade in billions like gold and silver. In Oct 1997, eight banks including State Bank of India, Indian Overseas Bank, Canara Bank and Allahabad Bank have been allowed import of gold which has been put under open general licensed category.

7) **Purchase and Sale of Foreign Exchange**

Banks buy and sell foreign exchange, promoting international trade. This function is mainly discharged by Foreign Exchange Banks.

8) **Letter of References**

Banks also give information about economic position of their customers to domestic and foreign traders and vice versa

**GENERAL UTILITY FUNCTIONS**

Apart from the primary and secondary functions, the banks also provide many more utility services to the public. These services are:
1) **Locker Facilities**

Banks provide locker facilities to their customers. People can keep their valuables or important documents in these lockers. Their annual rent is very nominal.

2) **Acting as a referee**

The customer if desires, the bank can perform the services as a referee. The third parties can request the banks for seeking information regarding the financial position of the customers. The bank will act as referee only and only if it is desired by the customer, otherwise the secrecy of a customer's account is maintained very carefully.

3) **Issuing letters of credit**

The Banks also issue letters of credit to certify the credit worthiness of the customers. Letters of credit are very popular in foreign trade.

4) **Acting as Underwriters**

Banks also underwrite the securities issued by the Government and Corporate bodies for a commission. The name of bank as an underwriter encourages investors to have faith in the security.

5) **Acting as information banks**

Commercial banks also act as information bureau as they collect the financial, economic and statistical data relating to industry, trade and commerce. HDFC Bank is providing information relating to NRI Schemes and commentaries of experts on development in the areas of finance through Internet facility.

6) **Issuing Traveller’s cheques and credit cards**

Banks have been rendering great service by issuing traveler's cheques, which enable a person to travel without fear of theft or loss of money. Now, some banks have started credit card system under which a credit card holder is allowed to avail credit from the listed
outlets without any additional cost or effort. Thus, credit card holder need not carry or handle cash all the time. Now, International credit cards have joined hands with Indian Banks.

7) **Issuing of gift cheques**

Certain banks issue gift cheques of various denominations, *e.g.* Some Indian banks issue gift cheques for the denominations of Rs. 21, 31, 51 and 101 etc. They are generally issued free of charge.

8) **Dealing in Foreign Exchange**

Major branches of commercial banks also transact business of foreign exchange. Commercial banks are the main authorized dealers of foreign exchange in India.

9) **Merchant banking Services**

Commercial banks also provide merchant banking services to the customers. They help in availing loans from non-banking financial institutions.

10) **Help in Transportation of Goods**

Big businessmen or industrialists after consigning goods to their retailers send the railway receipt to the bank.²

1.3 **CLASSIFICATION OF BANKS**

**GENERAL CLASSIFICATION**

In general, banking may be classified as retail and corporate banking.

(a) **Retail Banking**

It is type of banking, which is designed to meet the requirement of individual customers and encourage their savings. It includes payment of utility bills, consumer loans, credit cards, checking account and the like.

(b) **Corporate Banking**

It caters to the need of corporate customers like bills discounting, opening letters of credit, managing cash, etc.
ACCORDING TO OWNERSHIP

(a) Public Sector Banks

Public sector banks are those banks that are owned by the government. The government of India owns these banks. In India, twenty banks were nationalized in 1969 and 1980 respectively. Social welfare is the main objective. These are banks where the majority of stake is held by the Government of India or RBI. The two categories of Public sector banks are:

(i) State Bank Group


(ii) Other Nationalized Banks

These Banks are the banks owned by Government of India and established under two Acts, Banking Companies Act, 1970 and Banking Companies Act, 1980.

(b) Private Sector Banks

In Private Sector Banks, the majority of their share capital is held by private individuals. These banks are registered as companies with limited liability. Private Sector Banks can further be divided into Indian Banks and Foreign Banks. Foreign Banks are banks which are registered with their headquarters in a foreign country but operate their branches in India.

(c) Regional Rural Banks

Regional Rural Banks are established under Regional Rural Banks Act, 1976. It was established with the
objective to develop rural economy by providing credit and other facilities to small and marginal farmers, agriculturists, artisans and small entrepreneurs. Though they are a separate body corporate with perpetual succession & common seal, it is closely linked with Commercial Banks which has sponsored the proposal to establish it. These are the banks that are owned and run by private sector. An individual has control over these banks in proportion to the shares of the banks held by him.

(d) Co-Operative Banks

These banks are jointly run by a group of individuals. Each individual has an equal share in these banks. Its shareholders manage the affairs of the bank. First Co-operative Societies Act was enacted in 1904 called as Co-operative Credit Societies Act, 1904 and it was subsequently amended in 1912. Its objective was to relieve farmers from the clutches of moneylenders and indigenous bankers. These societies are formed both under state level and district level with further division on the basis of purpose of forming the societies.

according to law

(a) Scheduled Banks

Schedule banks are the banks, which are included in the second schedule of the banking regulation act 1965. These banks have paid-up capital and reserve not less than Rs. 5,00,000. They also satisfy RBI, that its affairs are not conducted in a manner detrimental to the interest of its depositors. Schedule banks are sub-divided as State co-operative banks and Commercial banks.
(b) **Non-Scheduled Banks**

Non-schedule banks are the banks, which are not included in the second schedule of the banking regulation act 1965. They do not satisfy the conditions laid down by schedule. These are the banks having paid up capital, less than Rs. Five Lakhs. They are further classified as Central Co-operative banks, Primary Credit Societies and Commercial banks.

**ACCORDING TO FUNCTION**

(a) **Commercial Banks**

These are the banks that do banking business to earn profit. These banks provide loans for short period to businesses and in the process create money. Credit creation is the main function of these banks.

(b) **Foreign Banks**

These are the banks that are incorporated by foreign company. They have set up their branches in India, but their head offices are in foreign countries. Their principle function is to make credit arrangement for the export and the import of the country and these banks deal in foreign exchange.

(c) **Industrial Banks**

Industrial banks are the banks that offer long term and medium term loan to the industries and also work for their development. These banks help industries in sale of their shares, debentures and bonds. They give loan to the industries for the purchase of land and machinery.

(d) **Agricultural Banks**

Agricultural banks are those banks that give credit to agricultural sector of the economy.
(e) **Saving Banks**

The principle function of these banks is to collect small savings across the country and put them to the productive use. In India department of post office functions as a saving bank.

(f) **Central Bank**

Reserve Bank of India is the Central Bank of India. Central Bank is the apex bank of the banking system of the country. It issues currency notes and acts as a banker’s bank. Economic stability is the principle function of this bank. In short, it regulates and controls the banking system of the country. ³

1.4 **HISTORY OF BANKING IN INDIA**

Banking in India has its origin as early as the Vedic period. It was believed that transition from money lending to banking must have occurred even before Manu, The great Hindu Jurist, who has devoted a section of his work to deposit advance and laid down rules relating to rate of interest. During the Mughal period, the indigenous Bankers played a very important role in lending money, financing foreign trade and commerce. During the days of East India Company, it was the agency houses that carried on the business. ⁴

The first bank in India, though conservative, was established in 1786. Since then, the journey of Indian Banking System can be segregated into three distinct phases:

- Early phase from 1786 to 1969 of Indian Banks.
- Nationalization of Indian Banks and up to 1991, prior to Indian banking sector reforms.
- New phase of Indian Banking System with the advent of Indian Financial & Banking Sector Reforms after 1991.

**Phase I**

The General Bank of India was set up in the year 1786. Next, it was the turn of Bank of Hindustan and Bengal Bank. The East India
Company established Bank of Bengal (1809). Bank of Bombay (1840) and Bank of Madras (1843) as independent units and called them Presidency Banks. These three banks were amalgamated in 1920 and Imperial Bank of India was established which started as private shareholders’ bank, mostly European share holders.

In 1865 Allahabad Bank was established and then Punjab National Bank Ltd. was set up in 1894. Between 1906 and 1913, Bank of India, Central Bank of India, Bank of Baroda, Canara Bank, Indian Bank, and Bank of Mysore were set up. Reserve Bank of India came up in 1935.

During the first phase, the growth was very slow and banks also experienced periodic failures between 1913 and 1948. There were approximately 1100 banks, mostly small. To streamline the functioning and activities of commercial banks, the Government of India came up with The Banking Companies Act, 1949 which was later changed to Banking Regulation Act 1949 as per amending Act of 1965 (Act No. 23 of 1965). Reserve Bank of India was vested with extensive powers for the supervision of banking in India as the Central Banking Authority.

During those days, public had lesser confidence in the banks. So, deposit mobilization was slow. Abreast of it, the savings bank facility provided by the Postal Department was comparatively safer. Moreover, funds were largely given to traders.

**Phase II**

The Government took major steps in Indian Banking Sector Reforms after independence. In 1955, it nationalized Imperial Bank of India with extensive banking facilities on a large scale especially in rural and semi-urban areas. Government formed State Bank of India to act as the principal agent to handle banking transactions of the Union and State Governments all over the country. Seven banks forming subsidiaries of State Bank of India were nationalized in 1960. On 19th July, 1969, major process of nationalization was carried out.
It was the effort of the then Prime Minister of India, Mrs. Indira Gandhi that 14 major commercial banks in the country were nationalized.

Second phase of nationalization of Indian Banking Sector Reform was carried out in 1980 with seven more banks. This step brought 80% of the banking segment in India under Government’s ownership. Following steps were taken by the Government of India to Regulate Banking Institutions in the Country:

- 1949: Enactment of Banking Regulation Act.
- 1955: Nationalization of State Bank of India.
- 1959: Nationalization of Sill subsidiaries.
- 1961: Insurance cover extended to deposits.
- 1971: Creation of credit guarantee corporation.
- 1975: Creation of regional rural banks.
- 1980: Nationalization of seven banks with deposits over 200 crores.

After the nationalization of banks, the branches of the public sector banks in India saw a rise in deposits and advances. Banking under the Governments’ ownership, gave the public implicit faith and immense confidence about the sustainability of these institutions.

**Phase III**

This Phase had introduced many more products and facilities in the banking sector as its reform measures. In 1991, under the chairmanship of Shri Narasimham, a committee was set up by his name which worked for the liberalization of banking practices. The country was flooded with foreign banks and their ATM stations. Efforts were being put to give a satisfactory service to customers. Phone banking and net banking was introduced. The entire system became more convenient and swift. Time was given more importance than money.⁵
1.5 STRUCTURE OF INDIAN BANKING SYSTEM

Indian Banking System occupies a significant role in nation’s economy. It plays a pivotal role in the economic development of the country. In India, the institutions in the organised sector of the money market, commercial banks and commercial cooperative banks have been in existence for the past several decades. Rural Regional Banks came into existence since the middle of seventies.⁶

During the recent past, the organised sector of the money market has penetrated into the rural areas and set up RRB in the region. Similarly, a variety of specialised financial Institutions have been set up in the country to cater to the specific needs of industry, agriculture and foreign trade.

The structure of Indian Banking System in the country is depicted in the following chart: ⁷

![Diagram of Banking Institutions](image)

Fig. 1.2: Structure of Banking Institutions
1.6 DEVELOPMENTS IN INDIAN BANKING

The Banking sector has come a long way from being a sleepy business institution to highly proactive and a dynamic entity.

Metamorphic changes took place in the Indian financial system during the eighties and nineties consequent upon deregulation and liberalization of economic policies of the government. Consequently, a sea change in money and capital markets took place. Application of marketing concept in the banking sector was introduced to enhance the customer satisfaction.

Banks marketing regarded as the part of management activity, which seems to direct the flow of banking services profitability to the customers. The marketing concept basically required a thorough understanding of customer need and knowledge about market.

The policy of privatization of banking services aim at encouraging the competition in banking sector and introduction of financial services. Consequently, services such as Demat, Internet banking, Portfolio Management, Venture capital, etc, came into existence to cater to the needs of the public. An important agenda for every banker today is greater operational efficiency and customer satisfaction.

The banks are devising various innovative services to meet the diverse needs of their customers. On the other side, customers of the modern times have also become conscious about their needs and requirements. Therefore, banks are transcending the routine banking operations and venturing into the hi-tech world of financial services.

Currently, overall banking in India is considered as fairly mature in terms of supply, product range and reach, even though reach in rural India still remains a challenge for the private sector and foreign banks. Well- computerized foreign banks are beginning to compete seriously with the nationalized banks. They aim at a
profitable and wealthy part of the market, and in contrast to the nationalized banks, do not recognize any social responsibilities to small account holders or to a rural and semi urban clientele. Almost 80% of the business is still controlled by Public Sector Banks. These banks are still dominating the commercial banking system.

The developments in Indian Banking during Pre-independence era, was started with the establishment of first Joint Stock Bank in the year 1986 and these developments took place till the independence. Post- Independence developments in the field of Indian banking took place, keeping in view the requirements of the economy. The major steps which were taken for the development of Indian Banks were:

**Pre-Independence Era:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>1786-1806</td>
<td>General Bank of India (Bank of Hindustan)</td>
</tr>
<tr>
<td>1809-1920</td>
<td>Presidency Bank</td>
</tr>
<tr>
<td>1840 (established)</td>
<td>Bank of Bombay and Bank of Madras</td>
</tr>
<tr>
<td>1895</td>
<td>Punjab National Bank</td>
</tr>
<tr>
<td>1906-1913</td>
<td>Banks like Bank of India, Central Bank of India, Bank of Baroda, Peoples Bank of India</td>
</tr>
<tr>
<td>1913-1917</td>
<td>Failure of Indian Banks due to World War I</td>
</tr>
<tr>
<td>1919-1925</td>
<td>Failure of Indian Banks due to inexperience of Indian Bankers in conducting banks in European style</td>
</tr>
<tr>
<td>1939-1945</td>
<td>Boom periods for Indian banks during World War-II</td>
</tr>
<tr>
<td>1947</td>
<td>Partition gave a jolt and created a lot of problems for Indian banks</td>
</tr>
</tbody>
</table>
**Post -Independence Era:**

1949 Establishment of RBI and Enactment of Banking Regulation Act

1955 Establishment of SBI by taking over Imperial Bank of India

1956 Nationalization of Life Insurance Companies

1959 Nationalization of SBI Subsidiaries

1964 Establishment of IDBI

1966 Devaluation of Rupee

1969 Nationalization of 14 Indian banks

1973 Enactment of FERA

1975 Creation of Regional Rural Banks

1978 Withdrawal of currency notes in denominations of Rs.1,000, Rs.5,000 and Rs.10,000 from circulation

1980 Nationalization of 6 Indian banks

1986 Launching of Indira Vikas Patra

1987 Introduction of 9% relief bonds to meet drought-related expenditure

1988 Launching of Kisan Vikas Patra to mobilize rural savings

1988 Establishment of National Housing Bank

1991 The dormant bank rate since July 1981, was hiked from 10% to 11% in July 1991, and further to 12% in October 1991

1992 Introduction of Dual Exchange Rate System under Liberalized Exchange Rate Management, enabling orderly transition from a managed floating regime to a market determined one
1993 Replacement of FERA with Foreign Exchange Regulation (Amendment) Act, 1993

1993 Issuance of Guidelines for setting up Private sector banks

1993 Rupee was partially converted

1993 Merger of New Bank of India into PNB

1994 Establishment of first private sector bank — UTI Bank


1994 Permission to nationalized banks to tap capital market for public contribution up to 49%

1994 Full convertibility of Rupee

1995 Banks to fix their own interest rates on domestic term deposits with maturity of 2 years

1996 Setting up of Insurance Regulatory authority to privatize insurance sector

1997 Issuance of RBI norms for NBFCs to improve their financial health

1997 Constitution of Working Group under the Chairmanship of S.H. Khan to examine DFIs and banks

1998 Recommendations of Khan Committee for DFIs and banks

1998 Recommendations of Narasimham Committee II on Financial Sector Reform

1999 Guidelines issued on Asset-Liability Management

2000 Entry of Banks into insurance sector

2001 Revised Guidelines for licensing of new banks in Private sector

2001 RBI clarifies approach to Universal banking
2003 Constitution of Listing Authority
2004 RTGS was introduced
2005 RBI announced norms for private sector banks
2005 NEFT AND EFT was introduced
2006 Implementation of cheque truncation system was introduced
2009 SBI Mobile services launched

1.7 INFORMATION TECHNOLOGY: MEANING

Information Technology refers to the acquisition, processing, storage and dissemination of all types of information using computer technology and telecommunication systems. These technologies are used for the input, storage, processing and communication of information. The Information and Information Technology are the two key drivers of the information age. The information age has ushered in a knowledge based industrial revolution. The business in this era is networked and uses IT to survive, grow and thrive in a highly competitive environment.

The Financial sector in general and banking industry in particular is the largest spender and beneficiary from the Information Technology. Information Technology has changed the structure of Indian Banking. It has changed from a business dealing with money transactions to a business related to information on financial transactions.

The Computerization in banking is taking place all over the world. The purpose of computerization is to bring technology to counter and enable the employees to have information at their fingertips. This has enabled the banks to offer better quality of
services to customers besides ensuring accurate information at a faster rate on banking transaction. Today, IT has become inseparable segment of any banking organization.¹

The banking sector in India is undergoing dramatic transformation. The intense competitive retail environment is compelling the banks to become customer centric. Banks are embracing technology to improve customer service, design flexible and customized products. Modern Information Technology appears to be a boon for them to increase the range of their products and market them more effectively and efficiently. In many ways, technology has become a blessing. However, the success of the banking industry depends largely on their quality of services. The advent of IT has greatly influenced the banking sector.

Technology in Indian banking in the form of E-banking can be used in four major ways:

- handling a greatly expanded customer base,
- substantially reducing the real cost of handling payments,
- liberating the banks from the traditional constraints of time and place,
- launching new products and services. ¹⁰

1.8 HISTORY OF INFORMATION TECHNOLOGY & ITS EVOLUTION IN BANKING SECTOR

Information technology or IT as it is commonly called, dates back to 5000BC, when people started using alphabets as a medium of communication. However, its actual emergence started with the first ever use of the computer. A simple device for performing arithmetic calculations was the slide rule; an analogue computer based on mechanical architecture was invented in early 1600s by William Oughtred. This was a breakthrough as most of the modern computers later used the same basic principle used by the slide rule.
The Pascaline, an advanced mechanical computer was invented by Blaise Pascal in the mid 1600s. Gottfried Wilhelm von Leibniz, a German mathematician and philosopher developed a mechanical computer called Leibniz machine in late 1600s. The real modern mechanical computer was conceived in 1822 by Charles Babbage, and English mathematician. This essentially encompassed the modern day concept of storage, a mill and a punch card. This technique was also adopted in the textile industry by Joseph Marie Jacquard in early 1800s, wherein he essentially used punch cards, binary logic and real time programming software.

In 1840, came the electro-mechanical age with the discovery of different ways to harness electricity and the information was converted into electric impulses. This led to the beginning of telecommunication and telegraphy in late 1800s. The first electro-mechanical computer was invented by Herman Hollerith in 1880 and they were marketed under the logo of International Business Machines (IBM). In 1942, Howard Aiken, a research student at Harvard University built the first generation modern computer named ‘Mark I’. It was 8 feet tall, 51 feet long, two feet wide, weighed 5 tons and employed 750,000 components.

The emergence of electronic vacuum tubes in 1940s saw the first high-speed, general-purpose computer, called by the inventors as ‘Numerical Integrator and Computer’ (ENIAC). Maurice Wilkes, a British scientist at Cambridge University, completed the designing of EDSAC (Electronic Delay Storage Automatic Calculator) in 1949. Thus, EDSAC became the first stored-program computer in general use (i.e., not a prototype). The first general-purpose computer for commercial use was designed in the late 1940s by Eckert and Mauchly and christened as UNIVAC (Universal Automatic Computer).

The next fifty years brought metaphors in the computing technology. The period is divided into four generations. The first
generation of digital computing was in the era of 1950s when the vacuum tubes were the main logic elements and the data was stored externally as punch cards and internally as rotating magnetic drums. That was the first time when the term 'software' evolved. However, the revolution in the computer technology came with the advent of solid state electronics in the late 1950s. This was called 'second generation' and was developed in the 1960s.

The third generation started in the mid 1960s and went up to mid 1970s, during which the individual transistors were replaced by Integrated circuits. The 'Fourth generation' or better the present generation started in the mid 1970s when many integrated circuits were bunched together into a small unit called 'microprocessor'. The first IBM personal computer was launched in 1981 with 'Microsoft - Disk Operating System' (MS-DOS) as the operating system. First MS Windows operating system debuted in 1983 but was only taken off as WINDOWS 3.1 in 1990. The revolutionary technologies in the mid 1990s made computers powerful, and, in the coming year its commercial application was exploited, besides computations. Similar applications in communication and information dissipation led to the term 'Internet'. By mid 1990s, the 'Internet' connected millions of computers throughout the world. Many commercial networks and data services also provided at least indirect connections to Internet. The original services of Internet were electronic mail (e-mail), file transfer Protocol (ftp) and remote computer access (telnet). The world wide web (www) which enables simple and intuitive navigation of Internet sites through a graphical interface, expanded dramatically during the late 1990s to become the most popular component of the Internet, thus providing a platform for the flow of a vast knowledge base. During this period the word 'IT' was coined. Even though the history of IT dates back to 5000 B.C., now the word IT works more or less in concurrence with the software running on the computers.
Viewing the technological developments in India, it came into existence as early as in the 1980’s in banking Industry through Rangarajan Committee (1984 & 1989) recommendations and later progressed through the Saraf Committee (1998) and the Vasudevan Committee (1998) recommendations.  

1.9 CONCEPT & GENESIS OF E-BANKING

Finance function is the backbone of business transactions. Business transactions are undergoing day-by-day technological change. So, traditional form of Finance Function is not enough to cope-up with pace of changing technological scenario. The comprehensive form of this technological change in finance function is E-banking. E-banking is of recent origin, especially in India, it is still in its adolescent age.

"E-banking means offering, supplying & delivering banking products and services through various electronic delivery channels via electronic devices".  

The origin of Electronic Banking and Payment System Automation can be traced back to the 1950s. Stanford Research Institute and Bank of America in the United States worked together to bring about two important innovations in the banking sector- Electronic Recording Method of Accounting (ERMA) for automating and recording transactions in accounts and Magnetic Ink Character Recognition (MICR)-based cheque processing. They worked from 1951 onwards and developed these capabilities by 1956. It was in 1959 that General Electric delivered the first set of ERMA Mark II, thus starting the commercial implementation of the electronic solution and MICR-based cheque clearing in the banking industry. This MICR-based cheque clearing was initially implemented in the USA in 1959 and has grown from systems in various modes and it remains the backbone for E-payment systems in many of those countries.
1.10 FACETS OF E- BANKING

The following services are being used to carry out various E-banking transactions like cash payments, transfer of funds, payment of utility bills, dividends, etc.

- Automated Teller Machines (ATMs).
- Electronic Funds Transfer (EFT).
- Electronic Data Interchange (EDI),
- Electronic Clearing System (ECS).
- Shared Payment Network System (SPNS).
- Debit Cards/Credit Card.
- Telephone Banking.
- PC Banking.
- Mobile Banking.
- Internet Banking.

The Delivery of services through the most popular channels like ATMs, call centers, tele-banking, debit/credit cards are growing at an ever-increasing pace. These channels also act as product differentiators depending upon the range and quality of services offered to the customers. Banks are expected to use these not only to keep operational costs low but also to satisfy the customers.¹⁴, ¹⁵, ¹⁶

1.11 BANKING PRODUCTS & SERVICES UNDER E - BANKING

Basic Services

- Account enquiry
- Funds transfer
- Bill presentment and payment
Value-added Services

- Cash management
- Credit and debit cards
- Customer correspondence
- Foreign exchange transactions
- Demat holdings
- Online trading
- Account opening
- Requests and intimation
- Financial advice
- Insurance
- Tax services
- Shopping
- Standing instructions like stop payment of some cheque, tax payment, electricity bill payment, insurance premium payment, collecting receipts from customers’ business clients etc.
- Investments
- Asset management services
- Brokerage ¹⁷

1.12 BENEFITS OF E-BANKING

The various benefits which the customers, banks, merchants, traders and government can take from E-banking are explained as follows:

Benefits to the Customer

- Anywhere Banking - no matter wherever the customer is in the world, on-line banking is just a web-site away. Balance
enquiry, request for services, issuing instructions etc. from anywhere in the world are possible.

- **Anytime Banking** - Managing funds in real time and most importantly, 24 hours a day, 7 days a week.

- **Convenience** acts as a tremendous psychological benefit all the time.

- **Cash/card free banking** through PC banking. E-banking expands the domain of access to banking services.

- **Brings down** “costs of banking” to the customer over a period of time.

- **Cash Withdrawal** from any branch/ATM.

- **On-line purchase** of goods and services including on-line payment for the same.

**Benefits to the Bank**

- Innovative, secure, addresses competition and presents the Bank as technology driven in the banking sector market.

- Reduces customer visits to the branch and thereby human intervention. This impact tells upon establishment costs of the Bank.

- Inter-branch reconciliation is immediate there by reducing chances of fraud and misappropriation. Online Banking – an effective medium of promotion of various schemes of the Bank - A marketing tool indeed.

- E-banking site can act as a revenue earner through promotion activity by consumer corporates. Integrated customer data paves way for individualized and customised services.

- E-banking provides competitive advantage to the Bank.
• E-banking provides unlimited network to the bank and is not limited to the number of branches. Any PC connected to modem and telephone having internet connection can provide banking facility to the customer. Any ATM on the road-side can meet cash withdrawal needs of the customer.

• By connecting all the branches through WAN (wide area network), anywhere banking facility can be provided.

• By connecting ATMs & POS terminals on-line, risk of overdraw can be eliminated in case of ATM, credit and debit cards.

• Load on branches can be considerably reduced by establishing centralised data base.

• ATM can be better monitored and planned by establishing a centralised data warehousing and using latest data mining tools, thereby increasing the scope and potential for better profitability.

• Helps in establishing better customer relationship, retaining and attracting customers.

Benefits to Merchants and Traders

• Increase in business because of increased purchasing power of the credit cardholders and ease with which purchasing can be done.

• Less need for merchant/ traders to provide credit facility to their customers.

• Making E-commerce a reality and globalizing the trade.

• Development of global and loyal clientele base. Assured immediate settlement / payment.
Avoid all the cost and risk problems involved in handling cash.

Providing services of international standard at low transaction cost.

Benefits to Government and Nation

- Globalisation of Trade through E-commerce.
- Providing global market to the national products and services.
- Establishment of e-commerce in India will promote exports and increase inflow of foreign exchange.
- Promotion of e-commerce and e-banking will eliminate the risk of carrying heavy cash.
- E-banking and e-commerce will improve transparency in transactions. 18,19

1.13 DRAWBACKS OF E-BANKING

- The biggest concern is of security and confidentiality, apart from the shifting customer loyalty due to multiple relationships and multiple accounts with banks and the ease at which a customer can change their banks.

- Transparency, disclosure requirements, anti-money laundering adherence to Know Your Customer (KYC) norms, privacy and outsourcing concern all banks around the world apart from the customer of security standards.

- Disadvantages include security, hacking attacks, all transactions not being possible through e-channels, slow adoption of E-banking, lack of human interface, loss of opportunity in potential business leads, huge capital requirement, disproportionate level of penetration and customer education.
• Trust of customers in an E-banking venture is an important concern. Many customers hesitate to deal with E-bank as they are not sure of the quality of products and services they will receive.

• There are various banking products like loans and mortgages, withdrawal of cash, etc., that require to be delivered in physical form after proper authentication of the customer. These issues can drive the customer away from E-banking.

• The privacy of information on the customer’s preferences, credit card and bank account details, etc. are mainly technological issues, but human factor is important both at the business and the customers’ end in building the trust in the system.

• Authentication of a deal, identification of a customer etc., are important technological and systems issues, which are a major source of concern for E-banking.

• Accessibility of net in case of internet banking by the customers is an important issue. This is particularly applicable in India where awareness of internet is in its nascent stage.

• Banking sites can be difficult to navigate and it takes some time to read the tutorials in order to become comfortable with the virtual lobby. 20

1.14 E- BANKING AND RISK MANAGEMENT

Along with new business opportunities and benefits for customers from electronic banking, come various risks that must be addressed by bank management and the regulatory supervisory authorities.
Operational Risk

The central use of new technology to provide E-banking services has important implications on banks’ operational risk. This new technology may require changes in procedures which supervisors use to ensure that banks properly manage their E-banking risks in the areas of security, data confidentiality, data system integrity, system availability, and outsourcing to reputational and legal risks for banks, since, for example, breaches of securities can have damaging effects on the reputation of a bank, while also having legal consequences. For virtual banks, which conduct their entire business through electronic distribution channels, these risks are paramount. Some of the main aspects considered to significantly contribute to operational risk from E-banking are summarized below.

Security is considered as the central operational risk of E-banking. Threats can come from inside and outside the system. They include unauthorized access to the system through, for example, “back doors”, “brute force”, “hijacking”, “sniffing”, or “spoofing” to retrieve and use confidential consumer information, add customer assets, subtract customer liabilities. Security measures must ensure the confidentiality of data, as well as integrity of the system and data. The first refers to ensuring that data is not being accessed or transmitted by unauthorized sources. The latter refers to the accuracy reliability and completeness of information processed, stored or transmitted between banks, their customers, and external service providers.

In addition to security, system availability is an essential criterion to limit operational and reputational risk for banks. To take full advantage of the potential benefit of E-banking services, system should be available on a 24-hour basis. In addition, reliable performance, fast response time, and swift recovery capability are crucial. Capacity planning is also important to address increasing
transaction volumes and new technological development. Increasing reliance on outsourcing can add substantially to banks operational risk. Outsourcing not only introduces an additional security threat, it can also have a major impact on the data and system integrity and availability.

**Reputational Risk**

Reputational risk is considerably increased through E-banking. If a bank fails to deliver secure, accurate and timely services on a consistent basis, its reputation is at risk. In addition to system availability and integrity breaches in data confidentiality and any other lackness to the security of operations can damage a bank's reputation.

For banks that rely entirely or predominantly on electronic delivery channels, reputational risk can be higher than for traditional brick-and-mortar banks. Problems that are encountered in one E-bank can potentially affect other E-banking service providers if customers' loose confidence in electronic delivery channels as a whole or view banks failures as being related to supervisory deficiencies in the system. Bilateral cooperation between the home and host country supervisors is crucial to minimize the risk of a country's reputation being affected by a (virtual) bank failing as a result of activities in an inadequately supervised host country.

**Legal Risk**

Legal risks can also arise from E-banking. Virtual banks can potentially expand the geographical scope of their services faster than traditional banks. In some cases, however, the banks might not be fully prepared and lack sufficient resources to become entirely familiar with the local laws and regulations before they begin to offer services in a new jurisdiction, either as a licensed branch or without license if this is not required. In the latter case, legal risk can be heightened because of lack of contact between the virtual bank and
the host country supervisor, resulting in the virtual bank being uninformed and unaware of regulatory changes. Violations of customer protection laws, including data collection and privacy, and regulations for soliciting could be important issues.

There are two other important sources of legal risk. First, there can be uncertainty about which legislation applies to E-banking transactions—the legislation of the jurisdiction in which the (virtual) bank is licensed or in which the services are offered. Both legislation might conflict with each other. And second, as a consequence of this, enforcement can be difficult. Moreover, enforcement of certain emerging areas of laws is uncertain, for example, laws related to electronic contracts and digital signature. 21

Other Traditional Banking Risks

The E-banking delivery channel also has implications for other traditional banking risks such as credit risk, liquidity risk, interest rate risk, and market risks.

(a) Credit Risk

The credit risk of a banking institution can be affected by E-banking activities in a number of ways. The use of the Internet delivery channel may allow banks, especially small institutions, to expand very rapidly, which could lead to heightened asset quality and internal control risks. The use of the Internet also allows banks to expand their geographic reach out of their traditional area, which increases the challenge of understanding local market dynamics and risks, verifying collateral and perfecting security liens with out-of-area borrowers. In addition, the Internet also makes it more difficult to authenticate the identity and credit-worthiness of a potential customer, which are essential elements to sound credit decision.
(b) **Liquidity Risk:**

The speed with which information and misinformation moves through the Internet can have implications for the liquidity risk profile of a bank. Adverse information about a bank, whether it is true or not, can be easily disseminated over the Internet through bulletin boards and news groups. This could cause depositors to withdraw their funds in mass at any time of the day, any day of the week.

(c) **Market Risk**

The impact of recent growth in securities issuance and trading over the Internet on bank’s market risk profiles is complex. From a market point of view, the increased volume of securities, which are traded over the Internet can on the one hand, lead to increased volatility, but, on the other hand, it can lead to increased liquidity. From an individual bank’s standpoint, banks may be exposed to increased market risk if they create or expand deposit brokering, loan sales, or securitization programme as a result of Internet banking activities.

(d) **Foreign Exchange Risk:**

A bank may be exposed to foreign exchange risk if it accepts deposits from foreign customers or create accounts denominated in currencies other than their local currency, since the Internet allows banks the opportunity to expand their geographic range, even internationally, some banks may take on greater foreign exchange risk through E-banking activities than they have through their traditional delivery channels. Also, foreign exchange risk can be intensified by political, social or economic developments, which a bank experienced in cross-border banking.
Supervisors should ensure that a bank initiating cross-border E-banking activities through the Internet has the appropriate risk management systems and expertise to manage these risks properly. 22

1.15 INTERNET BANKING

Banking is an industry that is based on intensive information, and transactions in banking can normally be consummated without any physical exchange. These ingredients have made banking a perfect passenger for the Internet vehicle. However, in the initial stages Internet banking had to go through hard times and failures. 23

(a) Concept

Internet was born in 1969 and Vinton Cerf is known as the father of Internet. Internet Banking means a kind of self help financial services provided by the bank for its clients by the medium of internet, including account information inquiry, account transfers and online payments etc. Online Banking is the practice of making bank transactions or paying bills via the internet. Thanks to the technology and internet in particular that no one has to leave the house for such odd jobs. One can shop on line and do banking online. Online banking allows communicating online and now one can even assess account information, transaction information, and instant fund transfer, cheques collection across cities and pay bills with the click of a mouse. 24, 25

(b) Types of Internet Banking

Currently, there are three basic kinds of Internet banking that are being employed in the marketplace:

Information: This is the most basic level of Internet banking. The bank has marketing information about its products and
services on a stand-alone server. This level of Internet banking service can be provided by the bank itself or by sourcing it out. Since the server or Web site may be vulnerable to alteration, appropriate controls must therefore be in place to prevent unauthorized alterations to data in the server or web site.

Communication: This type of Internet banking allows interaction between the bank’s systems and the customer. It may be limited to electronic mail, account inquiry, loan applications, or static file updates. The risk is higher with this configuration than with the earlier system and therefore appropriate controls need to be in place to prevent, monitor, and alert management of any unauthorized attempt to access bank’s internal network and computer systems. Under this system the client makes a request to which the bank subsequently responds. It works on the same principle as the e-mail.

Transaction: Under this system of Internet banking, customers are allowed to execute transactions. Relative to the information and communication types of Internet banking, this system possesses the highest level of risk architecture and must have the strongest controls. Customer transactions can include accessing accounts, paying bills, transferring funds, etc. These possibilities demand very stringent security. 

(c) Features of Internet Banking

Some of the distinctive features of Internet Banking are:

- It removes the traditional geographical barriers as it can reach out to customers of different countries or legal jurisdiction. This has raised the question of
jurisdiction of law / supervisory system, to which such transactions should be subjected.

- It has added a new dimension to different kinds of risks traditionally associated with banking, heightening some of them and throwing new risk control challenges.

- Security of banking transactions, validity of electronic contract, customers’ privacy etc., which have all along been concern of both, bankers and supervisors, have assumed different dimensions, given that Internet is a public domain, not subject to control by any single authority or group of users.

- It poses a strategic risk of loss of business to those banks who do not respond in time to this new technology, being the efficient and cost effective delivery mechanism of banking services.

- A new form of competition has emerged both from the existing players and new players of the market who are not strictly dealt by banks. 

(d) **Major Technological Developments in Internet Banking**

- The IT saga in Indian Banking commenced from the mid-eighties of the twentieth century when the Reserve Bank took upon itself the task of promoting automation in banking to improve customer service, book keeping, MIS and productivity. This role played by the Reserve Bank has continued over the years. Some of the major landmarks in this regard are:

- The introduction of MICR based cheque Processing - a first for the region, during the years 1986-88;
Computerisation of branches of banks - an activity which commenced from the late eighties with the introduction of ledger posting machines (LPMs), advanced ledger posting machines, followed by stand alone computer systems which metamorphosed into network based systems and the latest development pertaining to the installation of Core Banking Solutions.

Facilitating computerisation of Government business from the late nineties which has flaw resulted in all branches handling Government business perform their functions using technology;

The setting up of the Institute for Development and Research in Banking Technology (IDRBT) Hyderabad in the mid-nineties, as a research and technology centre for the Banking sector;

The commissioning in 1999, of the Indian Financial Network as a Closed User Group based network for the exclusive use of the Banking sector with state-of-the-art safety and security. The network supports applications having features such as Public Key Infrastructure (PKI), which international networks such as S.W.I.F.T. are now planning to implement;

Commencement of Certification Authority (CA) functions of the IDRBT for ensuring that electronic banking transactions get the requisite legal protection under the Information Technology Act, 2000;

Ensuring Information Systems Audit in the banks for which detailed guidelines relating to IS Audit were formulated and circulated;
- Enabling IT based delivery channels which enhance customer service at banks, in areas such as cash delivery through shared Automated Teller Machines (ATMs), card based transaction settlements etc.;

- Providing Guidelines for Internet Banking, which facilitated the banks to ensure that common minimum requirements relating to Internet Banking offerings were provided for;

- Providing detailed specifications to banks on the configuration of systems relating to critical inter-bank payment system applications such as Real Time Gross Settlement (RTGS) System, Negotiated Dealing System (NDS), Centralised Funds Management System (CFMS) etc.;

- Implementation of the National Financial Switch (NFS) to ensure inter-connectivity of shared ATMs and to provide for funds settlement across various banks.

- Establishment of e-payment gateways for the benefit of customers (such as the gate ways for funds transfers and other account related transactions) and for facilitating E-commerce.

- Sharing of information through the secured internet website for the Centralized Data Based Management System-Internet (CDBMSI) project. 28

1.16 Automated Teller Machine (ATM)

(a) Concept

Automated Teller Machine (ATM) is the most revolutionary element of virtual banking revolution. ATM's are self service vendor machines that help the banks to provide round the clock banking services to their customers without visiting to
the bank premises. They enable the banks to transact more business by offering various services in cost effective way on one side and to get more customer satisfaction on the other.

Don Wetzel of USA is credited as the inventor of the ATM in the year 1960, who created the machine while working for the Docutel Company in Dallas, Texas. In India, the first bank to introduce the ATM concept in India was the Hongkong and Shanghai Banking Corporation (HSBC), in the year 1987. Now, almost every commercial bank provides ATM facility to its customers. The first bank to cross 1,000 marks in installing ATMs in India was ICICI. SBI is following the concept of ATMs in Quantity. But Private Sector Banks have taken the lead. ICICI, UTI, HDFC and IDBI count 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 centers or entering into tie-ups with other banks.

In order to avail the ATM services, customers are provided with ATM card, which is a small plastic card with the magnetic strip containing information about the name of the bank, name of the customer, card number, validity period and signature panel. The magnetic strip contains information about the customer which enables the banks to verify the identity when the card is inserted at the slot provided in ATM. 29

(b) Types of ATM

The first ATM to be installed in India was by HSBC in 1987 at Mumbai. There are different kinds of ATMs used by the banks for the customers. The classification can be according to location, links, card insertion and loading of cash.
(i) **Onsite and Offsite ATMs**

Such Machines which are situated at the premises of the bank are known as onsite ATMs and the one that are located at some busy places are known as offsite ATMs like food worlds, Railway station, bus stops, shopping malls, petrol pumps etc.

(ii) **Stand alone and Net-worked**

ATMs which are not linked to the hub of the bank to which it belongs are stand alone ATMs. But these ATMs are not popular now a days. Net-worked ATM on the other hand are those which are linked to the branch and also linked to the branches across the country, means a customer of a particular bank can withdraw money from any branch of any bank at any city.

(iii) **Dip-card and Motorized**

In this type, the customer is required to dip the card and take it back to do the transaction is known as dip card. The sensors of the machine identify the customer and greet him with the voice. On the other hand, motorized ATMs are very prevalent among all. In this,
the customer inserts the card in the machine and takes it back when the transaction is over. In some machines, the card is immediately taken back whereas in some machines the card automatically comes out when cash is withdrawn.

(iv) Front and Back

The ATM compartment is closed and cash is loaded, whereas in back loading, cash has to be regularly loaded in the ATM machines. In the front loading the door of behind the ATM and a message is displayed that “Please wait for sometime, some services are being carried on”. 

(c) Functions of ATM

The functions of ATM differ from Bank to Bank. The following features are available in the ATM of all the Banks:

Fast cash: When you want to do the only activity of drawing cash in pre-determined amounts like Rs. 500, Rs. 1,000, Rs. 2,000, Rs. 5,000 etc. you can use this option.

Normal cash withdrawal: Every bank has fixed a maximum limit of cash withdrawal per account per day. It ranges between Rs. 10,000 - 15,000. While in some banks the maximum amount may be drawn in one shot (HDFC, ICICI) and in some other banks it should be drawn in lots e.g. Syndicate Bank, State Bank of India). All withdrawals shall be in multiple of Rs.100 only.

Balance Enquiry

Mini statement of account: You get detail of last 5-10 transactions.

PIN change.
Cash Deposit: Varied procedures exist. Here special covers are available in the ATM wherein the client has to fill up the Chillan, the denominations and key in these details. Then, a window opens wherein the cover containing the cash has to be dropped. At the end of the day, officials of the branch to which the ATM is attached, would open the machine, take the cover and credit the account of the customer. If there is any difference between the amount fed and the actual cash in the cover, the decision of the bank is final.

Transfer transactions: If you want to transfer funds within the bank i.e. from one account to another at the same branch or at different branches, you can use this option.

**d) Advantages of ATM**

<table>
<thead>
<tr>
<th>BANKS PERSPECTIVE</th>
<th>CUSTOMER PERSPECTIVE</th>
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<tr>
<td>LESS SPACE REQUIRED</td>
<td>NO NEED TO CARRY CASH</td>
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<tr>
<td>LOW CAPITAL EXPENDITURE</td>
<td>NO NEED TO VISIT BRANCH FOR TRANSACTION</td>
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<tr>
<td>BANK'S STAFF GETS MORE TIME FOR MARKETING</td>
<td>ANY TIME, ANY WHERE, ANY HOW BANKING</td>
</tr>
<tr>
<td>LOWER TRANSACTION COST</td>
<td>FAST AND EFFICIENT SERVICE</td>
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<tr>
<td>WIDER CHOICE WITH THE BANK TO ADVERTISE THEIR PRODUCTS</td>
<td>GOOD CURRENCY NOTES</td>
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Fig. 1.4: Advantages of ATM

**Advantages to Banks**

- Less space required
- Capital expenditure is lower as compared to Branch
- Bank's staff gets more time to do marketing
- Lower transaction cost
- One more means for advertising Bank's Products to Customers
Advantages to Customers

- Convenience of shopping- no need to carry cash
- No need to visit branch for transaction
- AAA Banking-Any time, Anywhere, Anyhow.
- Fast and efficient service
- Good currency notes

1.17 MOBILE BANKING

(a) Concept

The Federal Reserve survey defines mobile banking as "using a mobile phone to access your bank account, credit card account, or other financial account. Mobile banking can be done either by accessing your bank's web page through the web browser on your mobile phone, via text messaging, or by using an application downloaded to your mobile phone."

In other words, Mobile banking can be defined as conducting banking and stock market services, administering accounts and accessing customized information through hand held electronic communication devices like mobile or cellular phones. It is also referred to as Wireless banking, SMS banking or M-banking. M-banking involves the use of mobile phone to carry out banking transactions. Various stakeholders in m-banking are consumers, merchant outlets, cellular operators, device manufacturers, banking and financial institutions, regulatory agencies and government. While customers look for secure, convenient and swift services, merchants look for faster- transactions and settlements.

The Mobile Banking is an extension of internet banking. The Bank can offer this service with the help of cellular
service providers. The facilities provided by mobile banking can be divided into two broad categories. First, Alert Facility, in which, mobile banking alerts inform the customer about the significant transactions in his Bank account. Second, Request Facility, in which, it facilitates the user of m-banking to enquire his account balance. The two-way text messaging system technology allows customers to submit requests and get answers from the bank on their mobile phones about banking transaction like clearance of cheques or credit balance.

The mobile technology enables the customers to pay the bill, to check account balance and cheque status, account statement enquiries, cheque book requests, to get minimum balance alerts, to request for recent transaction history and interest rates/exchange rates, and to get new product announcements on their mobile itself. At first, banks used mobile banking technology to convey account information to account holders. Wireless Application Protocol (WAP), SMS, SIM Toolkit, Interactive Voice Response and stand alone mobile application clients are the common standards in mobile banking. Among them SMS based mobile banking is the most popular one in Asia, especially in China and India, where low cost mobiles are high in number. In this mode two technologies viz. ‘pull’ and ‘push’ are used. Pull technology is used when a customer sends an SMS to the bank by typing his or her specific code or password to access specified account information, the bank replies via an SMS. For example by sending an SMS with keyword “HDFCBAL” HDFC bank customers can get their balance information on their cell phones. By using push technology banks can automatically send alerts to the account holders’
mobile phones. The registered users receive alerts anywhere in the world.\(^3^5\)

With the use of Mobile Banking following Transactions can be done:

**Account Information**
- Mini-statements and checking of account history
- Alerts on account activity or passing of set thresholds
- Monitoring of term deposits
- Access to loan statements
- Access to card statements
- Status on cheque
- Stop payment on cheque
- Ordering cheque books
- Balance checking in the account
- Recent transactions
- Due date of payment (functionality for stop, change and deleting of payments)
- PIN provision, Change of PIN and reminder over your mobile phone

**Payments, Deposits, Withdrawals, and Transfers**
- Domestic funds transfer
- Mobile recharging
- Presentment bills
- Payment bills
- E-commerce transactions: Shopping, book tickets online and many more to come.

**Support**
- Tracking your service requests
- ATM & Branch location \(^3^6\)
(b) Advantages of Mobile Banking

Mobile banking through cell phone offers many advantages for customers as well as banks. Some of them are as follows:-

To the Customers

(i) Mobile banking has an edge over internet banking. In case of online banking, there is a need of an internet connection and a computer. This is a problem in developing countries. However, with mobile banking, connectivity is not a problem, as one can find mobile connectivity in the remotest of places also where having an internet connection is a problem.

(ii) Customers can make transactions or pay bills anytime. It saves a lot of time.

(iii) Mobile banking through cell phone is user friendly. The interface is also very simple. You just need to follow the instructions to make the transaction. It also saves the record of any transactions made.

(iv) Cell phone banking is cost effective. Various banks provide this facility at a lower cost as compared to banking by self.

(v) Banking through mobile reduces the risk of fraud. Customers get an SMS whenever there is an activity in their account. This includes deposits, cash withdrawals, funds transfer etc. One gets a notice as soon as any amount is deducted or deposited from his/her account.

To the Bank

(i) Banking through cell phone benefits the banks too. It cuts down on the cost of tele-banking and is more economical.

(ii) Mobile banking through cell phone is very advantageous to the banks as it serves as a guide in order to help the banks improve their customer care services.
(iii) Banks can be in touch with their clients with mobile banking.

(iv) Banks can also promote and sell their products and services like credit cards, loans etc. to a specific group of customers.

(v) Various banking services like Account Balance Enquiry, Credit/Debit Alerts, Bill Payment Alerts, Transaction History, Fund Transfer Facilities, Minimum Balance Alerts etc. can be accessed from mobile.

(vi) Money can be transferred instantly to another account in the same bank using mobile banking.

(c) Challenges for Mobile Banking

Key challenges in developing a sophisticated mobile banking application are:

(i) **Handset operability**

There are a large number of different mobile phone devices and it is a big challenge for banks to offer mobile banking solution on any type of device. Some of these devices support Java ME and others support SIM Application Toolkit, a WAP browser, or only SMS. There is a myth that there is a challenge of interoperability between mobile banking applications due to perceived lack of common technology standards for mobile banking.

(ii) **Security**

Security of financial transactions, being executed from some remote location and transmission of financial information over the air, are the most complicated challenges that need to be addressed jointly by mobile
application developers, wireless network service providers and the banks' IT departments.

The following aspects need to be addressed to offer a secure infrastructure for financial transaction over wireless network:

- **Physical part of the hand-held device**: If the bank is offering smart-card based security, the physical security of the device is more important.

- **Security of any thick-client application running on the device**: In case the device is stolen, the hacker should require at least an ID/Password to access the application.

- **Authentication of the device with service provider before initiating a transaction**: This would ensure that unauthorized devices are not connected to perform financial transactions.

- **User ID/Password authentication of bank's customer**.

- **Encryption of the data being transmitted over the air**.

- **Encryption of the data that will be stored in device for later/off-line analysis by the customer**.

**Scalability & Reliability**

Another challenge for the banks is to scale-up the mobile banking infrastructure to handle exponential growth of the customer base. With mobile banking, the customer may be sitting in any part of the world (true anytime, anywhere banking) and hence banks need to ensure that the systems are up and running in a true 24 x 7 fashion. As customers will find mobile banking more and more useful, their
expectations from the solution will increase. Banks unable to meet the performance and reliability expectations may lose customer confidence. 38

1.18 Telephone Banking

(a) Concept

Telephone banking is a service provided by a financial institution, which allows its customers to perform transactions over the telephone. Telephone E-banking is very fast, convenient and secure for all customers. In Tele-Banking, one can dial a telephone number using a telephone to access the account, transfer funds, request statements or cheque book simply by following recorded message and just touching the keys of the phone. It allows the customers to check the account at the convenient time and get simple things done without visiting bank premises. The facility is offered free of cost to the customers.

The concept of telephone banking has been around for several decades. Initially, the process required manual intervention by a bank employee. Customers would call into the bank, answer questions to verify their identities, and submit queries to the service representative. While somewhat labour intensive, this approach did make it possible to conduct a number of banking transactions from the comfort of home.

With the advent of touch-tone services, the idea of telephone banking took on a new direction. Instead of connected with a live bank representative, customers could use the keypad on a touch-tone phone to enter an automated system and obtain information on bank accounts as of the latest posting day. One advantage of this newer approach is that bank customers could call any time of the day or night and check
the status of their accounts. As technology continued to progress, the scope of functions that could be performed with the automated system expanded, making the service even more valuable to customers.

(b) Working of Telephone Banking

There are several ways that a telephone banking service may be configured. Some function off a validation process that includes voice recognition before access to the customer accounts is granted. Other systems make use of login credentials such as user names and pass codes that must be entered using the telephone keypad. Once the customers enter the correct data, the automated system makes it possible to perform a wide range of functions in relation to the accounts connected with the login credentials.

(c) Functions of Telephone Banking

The typical bank telephone customer can access his or her accounts to perform a variety of functions. Balances can be checked and the latest activity can be reviewed. The customer can also transfer funds between accounts using telephone banking, as well as order more checks, make loan payments, or request information on other services the bank offers.

In addition to use by traditional banks, telephone banking is also utilized by virtual banks that rely heavily on telephone and Internet access to process transactions and provide information to customers. Telephone banks generally function primarily by establishing access credentials that can be used on any telephone with touch-tone service. In addition, the transactions or queries can be conducted around the clock, an advantage that allows the telephone
bank to seek clients in any area of the world where the bank is authorized to conduct business. 39

After having a brief discussion about Banking, E-banking and the E-services provided by banks, now it is imperative to study the various researches done on this aspect of Banking, so as to know the views and findings of the researchers. Also there is a need to know the satisfaction level of the customers regarding the E-services provided by banks and at the same time knowing the perception of the bank officials regarding these E-services.

REVIEW OF LITERATURE

Every new thing is explored with reference to the old. Present conveys its meaning in terms of the past. It is universally acknowledged fact that effective research cannot be accomplished without critically studying what already exists in relation to it, in the form of general literature and specific studies. The survey of related literature therefore is considered as an important prerequisite to actual planning and execution of any research project. It helps to eliminate the duplication of what has been done and provide useful hypothesis and helpful suggestions for significant investigations. Citing studies that show substantial agreement and those seem to present conflicting conclusions help to sharpen and define understanding of existing knowledge in the problem area, provides a background for the research project and makes the researcher aware of the status of the issue.

As far as the fuller and better understanding of the problem is concerned, the research scholar has made her sincere efforts to review the related literature regarding the research problem taken by her. All the possible related books, journals, periodicals, research papers, thesis and dissertations
available from different sources were glanced through for this purpose.

This chapter explores the work that has been done in relation to satisfaction level of E-services among customers and employees of public and private sector banks. Emphasis has been given to study the comparison between selected public and private sector banks.

Shah (1977) emphasized that slow growth in productivity and efficiency, surplus work of banks with higher profitability can result from increased spread but these innovations have a limited role to play. The author recommended the written job descriptions for improvement of staff productivity and the reduction of costs, creation of a team spirit, improvement in the management for improving bank profitability and productivity.40

Varde (1979) in his research paper emphasized that the efficiency of a bank could be classified into four categories (i) manpower efficiency, (ii) operational efficiency, (iii) commercial efficiency and (iv) efficiency of ancillary business. Efficiency according to each category can be measured separately, and measure of efficiency can be considered as productivity.41

Wadikar (1980) in his study highlighted that bank profitability in terms of assets and management of liability portfolio was the key factor in private sector banks. He revealed that performance of private sector scheduled commercial banks was better than public sector banks. The branch expansion was considered at a higher rate in private sector than in public sector banks. The expansion of banks in semi-urban and rural areas was also recommended.42

Mumupilly (1980) provided an analytical view of the trends in the components of cost of earnings of different groups of Indian commercial banks since nationalization. He studied the cost and
profitability of banking industry as a whole, rather than an individual bank.43

**Birla Institute of Scientific Research (1981)** in a study focused on the objectives of nationalization and their achievements, relative performance of private sector banks and nationalized banks and the effect of nationalization on rest of the banking sector. The study revealed that the growth and development in banking after nationalization was not just because of transfer of ownership. It was rather because various incentives and punitive measures were implemented with more vigilance and care.44

**Karka (1982)** while investigating the declining trends in profits, advocated some measures to improve the profitability in banks by increasing the margin between lending advances, borrowing deposit rates and improving the profitability of staff, and implementation of a uniform service changes.45

**Bilgarni (1982)** highlighted the growth in banking sector over a decade since nationalization in branch expansion, deposit mobilization, credit disbursement and priority sector lending. The author concluded that the regional and state-wise disparities in terms of banking services still exist, some healthy trends were developed significantly and if continued in future would further help in minimizing the widening gaps.46

**Nayan (1982)** in a study highlighted a performance evaluation model on the basis of quantifiable parameters of performance and concluded that the present system of ranking the banks on the basis of aggregate deposits failed to reflect their overall achievements & the existing system of performance budgeting is not suitable at branch level. On the basis of all the important and quantifiable parameters of performance, an integrated performance index needs to be developed for evaluating the performance of commercial banks.47
Amandeep (1983) studied the various factors which effect the profitability of commercial banks. The author tried to determine the share of each factor which determines the profitability of commercial banks. The trend analysis, ratio analysis, multiple regression analysis was effectively used to know the profitability of commercial banks.

Angadi & Devraj (1983) observed that besides the social responsibilities discharged by the public sector bank, deficiencies, ineffective mobilization of funds at lower costs, attractive retail banking, augmenting earnings from other sources, effective cash & portfolio management have contributed to declaration in productivity and profitability of banks.

Shah (1986) highlighted that the management should pay attention towards the empirical relationship between costs at branch level, the factors responsible for declining profitability and increasing operational cost at branch level and recommended feasible measure for appropriating overhead cost to various services at the lower level.

Chakrabarthy (1986) in his study used Herfindha's index to measure the inequality in the sharing of profits, net profits, earnings and expenses by each group of banker and suggested that each scheduled commercial bank should take up some exercise to evaluate the relative performance of each office of the particular bank for profit planning in future.

Prabhakar (1986) in his study revealed that in case of Indian banks, a major portion of complaints come from depositors expecting preference, which is neither possible nor permitted. The possibilities of dividing customers may be of some better service to important customers and the teller system partially serves this purpose. The author has clearly brought out that in India, there is a growing size of current and saving account holders, who do not maintain the statutorily required minimum balances. Thus, the size of defaulters is
high and growing, which would cause additional burden for banking staff.\textsuperscript{52}

\textbf{Gupta and Goswami (1986)}, investigated some radical change in measuring profitability of commercial banks and indicated the major cause for declining profitability in establishment costs. The author added that the conventional indications are based on published profits, which do not reflect the true position and he therefore suggested an alternative measure which is based on the cost of mobilizing business, equal elasticity of establishment costs to compare the operational efficiency and profitability of different banks.\textsuperscript{53}

\textbf{Joshi (1986)} in his study, discussed the various reasons and factors which showed declining trends in profitability in banking systems on the basis of data collected from the official publications of banks. The author suggested profit planning both at micro & macro levels for the banking industry to overcome the declining trends in profitability.\textsuperscript{54}

\textbf{Sachdeva (1987)} in his study, attempted to develop certain techniques to detect fraudulent transactions, fictitious documents and technological errors. The investigator suggested that there should be a provision for the training of the bankers to take up preventive and detective measures to nab certain unscrupulous customers who cause the problem of abuse of bank services. The author has developed different kinds of preventive and detective methods. Findings of the study further revealed that bank officers/officials should be provided two week’s training regarding knowhow of E-banking, ways to meet its implications, posting of E-detective specialists at the regional level. Legal experts in the field of E-technology, suggested some legal aspects to tackle such problems in banking sector.\textsuperscript{55}
Singhal (1987) in a study highlighted the customer services in Indian banks: (i) there were considerable differences between different banks in regard to employees job involvement, motivation, customer loyalty, identification of banks and employees attitudes towards bank customers and colleagues, etc. (ii) the demographic and psychological variables were identified and their relationship with employees job performance and customer service was explained. (iii) it was also found that there was no correlation between service efficiency and customers satisfaction.56

Chopra (1987) in his study, investigated the productivity of five selected national banks. However, during the study, it was found that the results were highly unreliable and the same were based on figures at current prices. The researcher was of the view that further investigation may be done on the same parameters to reveal more accurate results.57

Thaur (1987) examined that the banks are providing services of various types and the consumers are misusing the benefits provided by the financial institutes. The author has brought out several forms of abuse of bank facilities provided to customers in India. The consumers often indulged in un-ethical practices like non-repayment of loans, the submission of post-dated cheques in business for collection, raising overdraft from more than one bank and hypothecating the same to more than one financial institution etc.58

Ojha (1987) in his study explored the international comparison of productivity and profitability of public sector banks of India, on the basis of per-employee indicators. The author identified State Bank Group of banks and Punjab National Bank and said that Indian banks are the largest in all accounts. The investigator analysed the unsatisfactory performance in the case of Regional Rural Banks and relatively lower productivity in case of private sector banks.59
Husain (1988) explored the significance and importance of Information Technology in various sectors of the banking industry. The author further analyzed the various organizational, financial & functional problems which were faced in the initial stages of establishments of Internet facilities in banks. People were generally reluctant to accept new system, new technology and new innovation, howsoever beneficial it may be for the public. The investigator analyzed various issues which were involved in computerization, E-banking and Internet services.60

Singh (1990) in his research study depicted the productivity in the Indian Banking Industry. The author found the Intra-bank, Inter-Bank groups and inter-bank groups productivity of public sector banks and state bank of India Group and further analyzed branch productivity, per-employee productivity & financial parameters at constant prices. According to the author, the study did not consider nationalized Banks of the year 1980 and various causes of productivity in banks.61

John & Jauhari (1994) while advocating the importance of computers in banking industry explored various issues related to computerization and computer related bank services in banking industry in India. The researcher pointed out that whether banks use e-commerce & other IT systems to reinvest themselves, gain access to new marketers, become extinct as dinosaurs or whether advances in technology create new opportunities for banks. The author has suggested various factors to make the bank services more accessible, cost-effective and customer friendly.62

Satyamurty (1994) discussed the concepts of profits, profitability and productivity which are applicable to the banking industry, organized by the bank managements that the pressure on the profitability is more due to the factors beyond their control. The author recommended the technique of ratio analysis to evaluate the
profit and profitability performance of banks. He opined that endeavors should be made to improve the performance through the better management.  

**Rugimbana and Iversen (1994)** in a study concluded that a strategy of stressing the most important perceived tribute of relative advantage was crucial to the success of the current efforts by bank marketers aimed at increasing ATM usage. Findings revealed that ATMs in Australia were still not performing to their full potential and by and large have not been accepted as innovations which can fully replace human tellers in nominated functions. The author has given possibility of future research as to examine the degree of fit between the demographic and psychographic profile of banking customers and predicted perceived attributes of ATMs for different institutions.  

**Rugimbana Robert (1995)** in a study determined the most significant predictor of ATM usage patterns by identifying those variables which distinguish between users and non-users. By assessing ATM usage patterns in relation to perceptual and demographic factors the study found that perceptual variables were far more powerful and, therefore, concluded that a strategy of stressing the most important perceived attributes, in particular relative advantage, was crucial to the success of the efforts of banking marketers.  

**Goode and Moutinho (1995)** tested a hypothesized model which was designed to measure the effects of free banking on perceived overall satisfaction attached to the use of automated teller machines (ATMs) for bank services. Overall a number of differences were found between students and normal customers with regard to confidence, charges and frequency of use. The implication of the study was that the financial services industry should place ATMs in more convenient locations and should target untapped demographic/psychographic groups. Financial services organizations should
develop and install ATMs which would perform more banking functions in order to obtain sufficient transaction volume to their operating cost.\textsuperscript{66}

\textbf{Murty (1996)} during his study pointed out the various factors which can be helpful to improve the profitability of public sector banks and also examined the impact of monetary policy and market interest rates on the bank profitability. The investigator also suggested various measures to improve the profitability and the quality of bank services in the public sector banks in India.\textsuperscript{67}

\textbf{Clifford (1996)} said that the dimensions of banking business are changing in the new economy. A study was conducted to determine the impact of Information Technological advances on the financial services. With the introduction of Technology, the role of banks, mutual and insurance companies are changing and the banks will never be the same as it were a decade ago.\textsuperscript{68}

\textbf{Ammayya (1996) and Godse (1997)} while appreciating the introduction of information technology in banks, stressed on training needs of people who play crucial role in turning the software and networking tools into a powerful combination to aid the bank in improving the service quality and performance.\textsuperscript{69}

\textbf{Sarker and Das (1997)} in his investigation evaluated the performance of public, private and foreign banks for the year 1994-95 through measures of profitability, productivity and financial management. The study revealed that the performance of Public Sector Banks was poor in comparison with the other two categories. However, no firm inference could be drawn from comparison done during a year.\textsuperscript{70}

\textbf{Bhattacharya (1997)} studied the seventy banks in the year 1986-91. They constructed one grand frontier for the entire period and measured technical sound banks and it was found that Public
Sector Banks had the highest efficiency among the three categories with foreign and private banks having much lower efficiencies. However, Public Sector Banks started showing a decline in efficiency after 1987, private banks showed no change and foreign banks showed sharp rise in efficiency. It was concluded that in the nationalized era, public sector banks were successful in achieving their principal objective of deposit and loan expansion.71

Booz Allen Hamilton (1997) conducted a global survey covering 386 retail and corporate banking institutions in 42 countries to assess the strategic impact of Internet banking on the financial service industry. According to the study, there is a huge perception gap between North American/European banks and Japanese banks regarding the future of Internet banking. The study also indicates the rapid growth potential of Internet banking.72

Brett (1997) while emphasizing the scope of E-money in the banking industry, stated that the coins and bank notes were replaced by digitally signed files, with the result that the cost of transferring the money was nearly zero. The author advocated that it is necessary to know the financial management in the electronic age. As a result the banks were providing different cards to their customers. The E-Money could be used at any time to pay for goods and services.73

Salma (1998) studied technological reforms in the banking sector. The emphasis on technology as the key factor for improving performance and increasing productivity in banks has been well exemplified by her through illustrations. Most Indian banks, mainly private ones, are hastening to interconnect their country wide branches. Keeping on the lines of promoting speed, SBI has introduced Electronic Fund Transfer Systems in thirty branches, and State Bank Instant Remittance.74
Diniz (1998) reported a survey of web sites of banks in USA. It was found that most of the bank websites were basic and intermediate level. No website was found to be of advanced level.75

Egland (1998) conducted the first important study that estimated the number of U.S. banks offering Internet banking and analyzed the structure and performance characteristics of these banks. They have found no evidence of major differences in the performance of the group of banks offering Internet banking activities compared to those that do not offer such services.76

Furst et. al. (1998) a U.S. based study found a significant shift by consumers and businesses to electronic payments. In response to developments in electronic payments and remote banking, banks have greatly increased their investment in technology, particularly in retail banking. The gains from technological advancements in banking and payments are likely to be substantial, both from the point of view of individual financial institutions and economy-wide. In this environment, banks should review and, if necessary, adjust their risk management practices in tandem with upgrading their technology activities.77

Das (1999) conducted a research study to reveal the performance level among public sector banks for three years in the post-reform period, in the years, 1992, 1995 and 1998. The researcher found that there was a certain level of convergence in performance and further revealed that there was a welcome increase in emphasis on non-interest income, banks have tended to show risk-averse behaviour by opting for risk-free investments.78

Malhotra and Arora (1999) in their study attempted to analyse the level of customer satisfaction in public and private sector banks, with the purpose of helping bank management to formulate marketing strategies to lure customers towards them. The study found that there were six factors determining satisfaction of public
sector customers. The factors in order of their importance were routine operation factor, price factor, situation factor, environmental factor, technology factor and interactive factor. Similarly, for private sector bank customer's staff factor, routine operations factor, service factor, environment factor, interactive factor, promotional factor, and situational factor were found to be important.79

**Mark and Chein (1999)** aimed at studying the overall satisfaction from ATMs and also the full spectrum services attached to ATMs. The proposed model was developed on the basis of three major blocks viz. endogenous services based input factors (overall satisfaction, recommendation to others, full use of services, frequency of use), latent variables (perceptions of relative influence, behavioral intentions), exogenous or output variables (expectations, perceived risk). The model was developed and it was found that satisfaction was positively related to most variables. Behavioural intentions were moderately linked to full use of services.80

**Sathye Milind (1999)** conducted a study aimed at quantifying the factors affecting the adoption of internet banking by Australian consumers. It suggested some ways to address the impediments, which could help in rapid migration of considerable savings in operating costs of banks. The study found no correlation between the factors like age, occupation, income and education and interest in internet banking. The study identified security concerns and lack of awareness about internet banking and its benefits as obstacles to non-adoption of internet banking in Australia.81

**Siriluck and Mark (1999)** aimed to identify how corporate consumers perceived barriers to usage of the internet banking provided by banks. To gain deeper understanding a qualitative study was conducted to explore the perceptions of internet banking among corporate consumers. The respondents were managers in the customer firms who have responsibility or financial functions of their
companies. Security of internet was found to be major inhibitor. Non users are much more service conscious and do not trust financial transactions made via internet channels. Legal support was also a major barrier to internet banking adoption for corporate customers.  

**Bajaj (1999)** highlighted that Information & Information Technology are the key drivers of the Information era. This period has ushered in a knowledge-based industrial revolution in which the business is controlled by networking and utilizing it to survive in a highly competitive environment. The relationship between Information Technology & business is very close and jointly affecting each other to boost the new trends in the market.  

**Edo (1999)** through a field research attempted to identify the important factors which influence customers’ choice of bank in the urban areas of less developed countries. The research aimed at informing banks of those critical factors that would determine their survival in today’s business. The study covered thirty cities and townships of Nigeria. The findings indicated that liquidity, speed of service and secrecy were the three critical factors in customers’ choice of bank. All the identified factors pointed out the same influence on both individual and corporate customers, which suggested that banks should minimize discrimination in their dealings with both kinds of customers.  

**Krishnan et al. (1999)** in their paper examined the drivers of customer satisfaction for financial services. The authors discussed the results on the basis of a full Bayesian analysis based on data collected from customers of a leading financial services company. The study found that satisfaction with product offering was a primary driver of overall customer satisfaction.  

**Daniel Elizabeth’s (1999)** study aimed to quantify the current provision of electronic services by retail banks in the UK and the republic of Ireland. Additional insight into the banks’ adoption of the
new channel was gained by exploring two areas important in the analysis of new offerings i.e. an organization’s approach to innovation and their view of the market. The study showed that the decision to adopt electronic banking was led by a corporate vision of the future in which the banking market became even more competitive, while consumers demanded greater accessibility, functionality and service at a lower price.86

Philip and Barton (1999) conducted a study which aimed to establish the extent to which multiple banking is practiced in Singapore, the banks at which main and subsidiary relationships are maintained and to see if certain demographic or personal characteristics can be used to differentiate a multiple bank user from a single bank user. The findings showed that if bank marketers want to differentiate between multiple and single bank User, they should do so using demographics rather than the use of personal characteristics.87

Szmigin Isabella and Bourne Humphrey (1999) examined the nature of a relatively new financial service, electronic cash. This research study was set up to investigate how consumers who had access to electronic cash actually used it. Deeming electronic cash to be an innovative product, the study also assessed how likely it was to be accepted or rejected by the target market. By assessing individual problems and preferences, the author hoped to offer recommendations for how the product could be further developed ‘and marketed.88

Aggarwal N., Aggarwal R. and Sharma P. (2000) explored the implementation techniques of Activity-Based Costing (ABC) in the banking sector on the example of an Estonian bank in order to analyze the cost structure for traditional and electronic channel transactions. The article showed how it is possible to implement ABC
in banking and proved empirically those electronic channels help reduce the costs of both banks and their clients.\(^8^9\)

**Guru et. al (2000)** examined the various electronic channels utilized by the local Malaysian banks and also accessed the consumers reactions to these delivery channels. It was found that Internet banking was nearly absent in Malaysian banks due to lack of adequate legal framework and security concerns. However over 60 percent of the respondents were having Internet access at home and thus represented a positive indication for PC based and Internet banking in future.\(^9^0\)

**Sullivan (2000)** found that Internet banks in Federal Reserve District incurred higher expenses but also generated higher fee income and concluded that the measures of profitability for Internet banks are similar to those of the non-Internet banks.\(^9^1\)

**Saxena (2000)**, in his study, pointed out the importance of Information Technology in the banking sector and emphasized that the future of banking industry will be even more exciting, interesting and challenging. The researcher has further revealed that Internet has enabled the banks to talk to each customer as an individual, keeping in view their different needs and requirements. Therefore, Information Technology will affect the productivity & profitability of the banks.\(^9^2\)

**Verma (2000)**, in his research work analyzed the effect of Information Technology on Public Sector Banks and Non-Public Sector Banks and also revealed that the Information Technology was a threat for the Public Sector Banks . The Public Sector Banks, and a small fraction of Non-Public Sector Banks have to do a lot to improve their productivity and efficiency. Non-Public Sector Banks were fully computerized and providing services on Internet. Especially ICICI bank and HDFC bank was very active on this front and was concentrating on Internet & E-commerce to offer their clientele with
full range of products. Findings showed that new banks like GTB, BOP, IDBI and UTI bank were not lagging behind, while some of them were concentrating on expansion and modernization in services.93

Shapiro (2000), explored the effects of cyberspace which threaten privacy and other constitutional rights, causing the liberty of the banking industry. The nature of cyberspace for grabbing will be different and will yield widely different experiences. The nature of cyberspace may flip instead of promoting free and open exchange. The cyber thefts are becoming more and more prevalent, which is a major concern for the customers, who will be more reluctant to avail E-services.94

Vageesh (2000), highlighted the approach of Non-Public Sector Banks who have adopted the latest trends in E-banking. The NPSBs, with their state-of-the-art technology and productive plans to make trends into e-banking, are now pioneers of the stock markets. Banks like HDFC & ICICI are entering into net banking which offers great convenience to the customers.95

Bhunia (2000), examined the future of Internet services. However, it was noticed that the number of Internet users has grown exponentially and the myriad services have improved with enhanced technological devices. The users have been provided the maximum opportunities to get the best use of E-services, in the Indian perspective. 96

Federick & Phil (2000), analyzed the effect of E-Loyalty and it was predicted that with the introduction of IT, many doubts and questions arouse in the mind of banking industry. In order to build Internet business, many executives concentrate all their attention on attracting customers rather than retaining them, with the intension to make unique economics of E-business, more loyal to customers, which is more important. The industry also intended to attract more and more E-tech friendly bank customers.97
Hegade (2000) studied the recommendations of Saraiya Committee, Talwar Committee and Goiporia Committee to improve the range and quality of customer services in banks. The author categorized bank customers in eleven parts i.e. Business, Salaried Class, Advocates, Peasants, Doctors, Nurses, Small Scale Industrialists, Transport Operators, Self Employed, Engineers. Others all the banks were divided into four parts, Public Sector Banks, Private Sector Banks, Co-operative banks and Rural banks. The investigator further analysed the wide range of bank-customer relationship, the role of bank staff and needs of customers to enhance quality services.

Nair (2000) said that the technological advancements achieved recently in the field of computerization, have unfolded many areas of innovations in our life styles. The global trend of banking is fast shedding its ancient image and entering from 'brick-and mortar' model to 'click' model. The author revealed that those banking and financial service providers who switch over to the electronic network in the quickest possible time frame alone will be able to survive. The introduction of Cyber Law will also boost the E-Commerce and E-Banking.

Nirajan (2000) added that the new trends in business through E-banking has changed the dimensions of banks due to the introduction of Information Technology and the banks are moving in directions other than loans & deposits. Banking in India will never be the same again. E-Banks have started E-Commerce and many banks are entering into the insurance sector. The author further explored the other possibilities of internet services, which can arise due to the mishandling of technological devices.

Caruana (2000) in a study identified service loyalty, customer satisfaction and service quality to exhibit acceptable psychometric properties in terms of both reliability and validity. The results
confirmed the hypothesized relationships in the research model. Service quality is found to act on service loyalty via customer satisfaction. The results also showed that while gender and marital status provided no basis for differentiation among constructions, education and age play a major role in determining different perceptions of customers about the constructs investigated. 101

**Kesic et al. (2000)** in their paper investigated the determinants of customer satisfaction in retail banking in the Republic of Croatia and examined whether the same determinants influenced satisfaction and future behaviour of bank's customers. The results of the research showed that relational and feature determinants were more important drivers to consumer's attitudes than core performance. 102

**Lasser et al. (2000)** in their study examined the effects of service quality on customer satisfaction from two distinct methodological perspectives. The findings indicated that these models of service quality did not perform equivalently in the particular setting. To the extent that the private banking industry represented both a high-contact and high-level service situation, it was concluded that Technical/Functional Quality-based model of service quality – compared with SERVQUAL based model - was better suited to predict customer satisfaction when customers were actively involved or highly interested in service delivery.103

**Mishra et al. (2000)** in their study investigated the implications of information technology tools on service quality perceptions concerning financial services and tried to identify the factors influencing customers’ overall satisfaction with the bank. The study indicated that customer perceptions about performance of the bank vis-à-vis their expectations were mixed. Both the groups i.e. direct uses of information technology driven services and non-users differ significantly
on several counts on one hand, while there was no difference on some other counts. \(^{104}\)

**Moutinho and Smith (2000)** in their study introduced a model which played a crucial role for the evaluation of bank customers’ attitude towards both human tellers and automated banking in mediating the ease of banking factor / perceived satisfaction linkage. The research findings clearly suggested that the drive towards ease of banking and convenience were favoured by the customer and, therefore, banks should find alternative strategic routes to improve service delivery. \(^{105}\)

**Balachandran’s study (2000)** focused on providing an understanding of the factors that affect the adoption of internet banking in Malaysia. The factors would certainly be of concern to both bankers and policy makers. Different factors were explored affecting the adoption of internet banking. Data was collected using online surveys. The findings indicated that except for perception for cost and internet access, trust in bank and security, there was a significant difference between two groups. \(^{106}\)

**Imtiyaaz and Molla (2000)** through their study explored the drivers and inhibitors of customers’ internet banking adoption in the sultanate of Oman. Based on the review of literature a questionnaire was developed. It was found that the Omani customers make their Internet Banking adoption decision based on its profitability, usefulness and ease of use. Extent of its usage in Oman was found to be influenced by the quality of connection and access.\(^{107}\)

**Krishnan and Ismail (2000)** examined the evolution of electronic banking in Malaysia, analysed the various electronic delivery channels utilized by local banks and to assess the consumer’s reactions to these delivery Channels. Different channels of bank service delivery analysed in this study were ATMs, telebanking, PC banking automated self banking centers and internet
banking. But main focus was on ATMs, telebanking and PC banking. It was found that for the successful implementation of e-banking in Malaysia, adequate legal and physical infrastructures were major prerequisites. Indicators were that the PC based channels of banking have not realized full potential in Malaysia. Survey findings were that most Malaysian banking customers still patronized bank branches. ATMs were found to be the most widely accepted and highly utilized delivery channel.  

Bajaj (2000) explored the e-commerce related issues which are adopted in recent information technology. The spread of Information Technology & the dramatic advances in financial theory have made it cheaper for big companies to raise money. Information Technology is also helping in cutting costs by providing cheaper ways of delivering services through, ATMs, telephone banking & the Internet banking to its customers. The author concluded that electronic payment systems are emerging & getting acceptance in the market.

Minjoon and Shuohan (2001) aimed at identifying the key dimensions of online banking service quality. Also the authors have tried to explore linkages between the online banking service quality dimensions and the customer satisfaction. Four key online banking service quality dimensions were generated. Also attentiveness dimension was found to play the most influential role in achieving a high level of customer satisfaction.

Kohli (2001) observed that the advancement in computerization and telecommunications has revolutionized the banking industry and the net services are fast catching on, with the result the e-commerce gets transformed into m-commerce with the increasing use of technologies like WAP etc. The author further emphasized on the importance of technology as an issue emerging from the Internet technology, who developed a key-driver of business in the financial services of banking industry.
Murty (2001) explored the significance and importance of banking services in the insurance sector. The entry of new banks into insurance is likely to give a stiff competition through their customized activities and technology to reach the customer with minimal resistance. On the eve of banks entry into insurance, made an attempt to trace the historical background of Indian private investment, bank’s eagerness to enter insurance market, basic mechanics of insurance functions of a typical insurer, different kinds of insurance coverage critical component of insurances business and how prepared banks are for exploiting these new business opportunities.  

Athanassopoulous et al. (2001) in their paper investigated the behavioural consequences of customer satisfaction in banking sector. More specifically, the authors examined the impact of customer satisfaction on customers’ behavioural responses. The findings indicated that when customers assessed customer satisfaction to be high, they either decided to stay with the existing service provider or subdue their negative behavioural intentions. He indicated that customer satisfaction was associated positively with word-of-mouth communication. In this respect, the research revealed the existence of six customer satisfaction dimensions ie. employee competence, reliability, product innovation, value for money, physical convenience.  

Colgate and Hedge (2001) attempted to investigate into the switching process of customers in retail banking. Results also indicated that although the majority of defecting customers voice problems to the firm and expected effective resolution of these complaints, but they were still staying silent about certain issues that were actually influential on their decisions to switch. Pricing problems was identified as the most influential factor on the decision to exit, yet it was the least likely reason for complaining. In contrast,
service failures and denied services were identified as more prevalent reasons for complaints but were less relevant for switching decisions.\textsuperscript{114}

**Gerrad and Cunningham (2001)** used a sample of Singapore’s undergraduates to establish a ranking of the various dimensions which influenced their bank selection decision and sought to determine how homogeneous undergraduates were in relation to their selection decision. Seven bank selection dimensions were identified. The most important criterion was that relating to “feeling secure”, while the least important dimension was third party influences. Responses between those attending engineering courses and non-engineering courses were compared as were those between “males and females” and “single and multiple bank users.”\textsuperscript{115}

**Lewis and Spyarakopoulos (2001)** focused their study on investigating the reasons for service failures and service recovery in retail banking. Different types of failures, and the recovery strategies used by Greek banks to respond to them were identified using the critical incident technique. The research data provided evidence of several types of service failures, representing both the outcome measures of service provision, such as lack of reliability and mistakes, and process dimensions of the banking sector, such as poor interaction with a bank employee.\textsuperscript{116}

**Pathrose (2001)** advocated that banking sector, the world over, is undergoing a rapid and radical transformation due to the pervasive influence of Information Technological advancements and breath taking innovations in the technology of telecommunication and electronic data processing. He reiterated that the winds of change are blowing in India, with the result, the IT which implies the integration of information system with communication technology has radically altered the traditional ways of delivering banking services. The key to
survival of banks, therefore, is retention of customers’ loyalty by providing them with value added services to meet their needs.  

**Reddy (2001)** stated that Banks are at different stages of technology adoption partly due to their different legacies, as much as the differences in their strategic approaches to computerization and technology absorption. The foreign banks are ahead in offering better banking services and products, coupled with smart use of IT adoption and have considerably achieved high operational efficiency.  

**Swamy (2001)** revealed the comparative performance of different bank-groups since 1995-96 to 1999-2000. During this period, Information Technology, new trends, deregulation etc. have taken place. He depicted the three aspects: (i) what impact of financial sector reforms made on the structure of the Indian banking system, (ii) What are the advantages reaped by some of the new Indian private and foreign banks with Public Sector Banks, (iii) Whether new competition has enhanced the overall efficiency of the banking system. The investigator concluded that NPSBs are much better than PSBs, even, better than foreign sector banks.  

**Adhivarahan (2001)** attempted to study the activities of the banks. The author in his study concluded that the number of incidents of e-fraud and on-line breaches is the highest in India and further cautioned the managers, administrators and the policy makers, that the Cyber crimes in banking sector have to be treated with more care. In order to face this problem, a Statutory Body like, Internet Fraud Center should be formed in India.  

**Avasthi and Sharma (2001)** added that advances in technology are set to change the face of the working of the banking. Latest trends in technology have transformed the delivery channels of banks in retail banking and have also greatly impacted the whole markets of banks. The authors explored the challenges which the banking industry as well as its regulators face.
Kaveri (2001) conducted a study on the recommendations of Verma Committee. In the year, 1998-99, the Reserve Bank of India considered nine efficiency parameters. With the result, Verma Committee identified weak banks, strong banks and potential weak banks. The parameters included were: Capital Adequacy Ratio, Net Non-Performance Assets, Net Profit Assets, Gross Profit or Working Funds, Net Interest Income/Total Assets, Interest Expended/Total Assets, Intermediation Cost/Total Assets, Provisions and Contingencies/Total Assets. The investigation revealed that no bank could be weak or potential weak all of a sudden, as there was a gradual deterioration in the status of loan default and profitability.\\n\textsuperscript{122}

Shastri (2001) conducted a study to find out the effect and challenges of new technology for banks. The author revealed that the conventional manual system of preparing vouchers, etc. was slowly being shifted to automated system with a view to save lot of time and effort which has resulted into a sea-change in the functioning of the banks. It was concluded that the use of ATMs and the introduction of more E-banking services have cut short the long procedural functioning of banks.\\n\textsuperscript{123}

Bhasin (2001) added that the computerization of banks has provided a major push for enabling them to enter into the newer activities and further analyzed the impact of IT on banking sector. The IT has explored, various aspects of our life which has transformed the repetitive and overlapping systems and procedures into simple single key pressing technology resulting in speed, accuracy and efficiency to conduct business. The banking sector has itself prepared itself and is strongly emerging to play a major role in nurturing e-commerce business. Few of the new private banks have taken an early initiative in these innovative areas; other banks are gradually catching up. The author is of the view that utmost
importance should be given to provide proper security infrastructure for routing transactions through the public network.  

**Suganthi et al. (2001)** conducted the review of Malaysian banking sites and revealed that all domestic banks were having a web presence. Only 4 of the ten major banks were with transactional sites. The remaining sites were at informational level. There are various psychological and behavioral issues as trust, security of Internet transactions, reluctance to change and preference for human interface which appear to impede the growth of Internet banking.  

**Aggarwal N, et al. (2001)** explored the implementation techniques of Activity-Based Costing (ABC) in the banking sector on the example of an Estonian bank, in order to analyze the cost structure for traditional and electronic channel transactions. The article shows how it is possible to implement ABC in banking and proves empirically that those electronic channels help reduce the costs of both banks and their clients.  

**Ashban and Mohammad (2001)** through their study titled customer adoption of tele-banking technology explored the adoption of tele-banking among the bank customers focusing primarily on the impact of customer characteristics on adoption and use. The field findings revealed that customers increasingly extend their use of tele-banking as their experience grows with the system. The results also indicated that in general, Saudi consumers' income level and education play a vital role in adoption and usage of tele-banking technology. The findings of the study do provide a platform for future investigation and diagnosis, as well as yielding valuable insights into the interrelationships among a number of relevant variables.  

**Minjoon and Shaohan (2001)** focused on the issues associated with Internet banking service quality. The study identified a total of 17 dimensions of internet banking service quality, which could be classified into three broad categories: customer service quality,
banking service product quality, and online systems quality. The study revealed that in terms of frequency of references to the seventeen dimensions, no substantial differences exist between internet-only banks and traditional banks offering internet banking service. The study found that the most frequently mentioned dimensions as the main source of satisfaction or dissatisfaction were reliability, responsiveness, access and accuracy.128

*Karjaluoto Mauza and Fento (2002)* aimed at analyzing mature consumers Internet banking behaviour. This paper studied the needs of mature Finish bank customers, and their reasons for adoption and non-adoption of Internet banking. The survey sample consisted of three consumer segments that differed in terms of Internet banking experience. The results of the study confirmed that mature customers are late adopters of Internet banking. Reasons indicated by factor analysis were practical problems, concerns about expensive start up, security and lack of personal service.129

*Janki (2002)* analyzed that in India, particularly Public Sector Banks will need to use technology to improve operational efficiency and customer services. Banks can use technology to meet customer needs and improve their interaction with customers, keeping in touch with telephone and Internet. The author further focused that technology will increase like never before, to add value to customer service, develop new products, strengthen risk management, and asset liability management and improve profitability. However, technology is only an enabling tool and whether banks actually achieve, what they want to get, will be determined by the drive and motivation of their work force and response of the staff.130

*Jamal and Naser (2002)* in their study attempted to understand the antecedents to and outcomes of customer satisfaction in retail banking. The paper reported findings from a survey that looked into the impact of service quality dimensions and customer
expertise on satisfaction. The customers of Abu Dhabi Commercial Bank (ADCB), UK was chosen as respondents for the study. The results indicated that customer satisfaction was based not only on the judgment of customers towards the reliability of delivered service, but also on customers’ experiences with the service delivery process. 131

Sharma (2002) in his study, Perceptions of Customers about Banking Services attempted to study the various dimensions of customer service in the banks. The various dimensions examined in this regard were, namely, satisfaction level regarding bank services offered to customers, reasons of dissatisfaction and banking habits of customers. The results of the study showed that respondents were not very much satisfied with the bank services. They were of the opinion that Bank services were fair. The reasons for the dissatisfaction were lengthy procedures, inefficiency on the part of the staff and poor service conditions.132

Wang et al. (2002) attempted to study the antecedents of service quality and product quality on satisfaction and bank reputation. The data was collected from the respondents of five different banks in China. The study indicated that overall service quality and product quality had its influence on satisfaction and bank reputation. It also found that reliability to be one of the key drivers of the product quality. Tangible was the most influencing factor of service quality, followed by reliability and product availability.133

Walter and Jhu (2002) explored the impact of information technology on service quality in the consumer banking sector. The key variables that describe IT based services included ease of use, conservation of time, convenience, privacy, accuracy, multifunctional capabilities and use of advanced IT, ATMs, online banking systems and internet banking systems. The primary purpose of the study was
to investigate the relationship between IT based services and customers' perception of service quality. According to the authors, the tangibles have changed probably from a motivation factor to a hygiene factor.\footnote{134}

**Karjaluoto Minna and Pento (2002)** in a study looked at individual differences in online banking in an effort to better understand the adoption of remote banking channels. Beliefs and attitudes were measured using Likert scale and semantic differentials. The data were analyzed using factor analysis, correlations and structural equation modeling. The study showed that prior experience of computers and technology, as well as attitude towards computers, influences both attitude towards online banking and actual behaviour.\footnote{135}

**Alumalai (2002)** in his research study explored the crucial aspect of Human Resource Department, job satisfaction and its significance in banking sector. The study also included factors associated with job satisfaction, dissatisfaction, present level of job satisfaction in different banking groups. The author observed that the higher level of job satisfaction ratio was 25% in State Bank India, 27% in nationalized banks and 28% in private sector banks. Hence, the study concluded that the level of job satisfaction ratio was higher in the private sector banks than nationalized banks, State Bank of India and its associated banks.\footnote{136}

**Barry and Hamilton (2002)** explored consumers existing financial services behaviour and assessed their attitude towards home based services i.e. telephone and internet banking. The study had two main objectives viz, obtain information about respondents changing attitudes towards bank delivery channels and ascertain important factors in encouraging and discouraging respondents’ use of telephone and net banking. The research results indicated that the branch network still remained the most popular delivery channel and
also all the consumers were not homogeneous in terms of their attitudes towards home banking.\textsuperscript{137}

**Boon and Cheng (2003)** in his study included ATMs, banking kiosks, phone banking, PC banking and branch network. The e-channels provide alternatives for faster delivery of banking services to a wider scope of customers. The author found that the factor analysis and spearman correlation examination implied that domestic banks in Malaysia could concentrate on enhancing their operations management and product management to succeed in providing the traditional branch banking as well as channels like ATM's, banking kiosks, phone banking and PC banking.\textsuperscript{138}

**Matuila Minna (2003)** focused on defining the factors influencing mobile banking services adoption by the bank customers and also aimed at forming a model describing consumer behavior patterns. The study shed light on the general usage of mobile services and in particular on the influence of demographic characteristics on usage. The research data was collected by means of traditional mail questionnaire. Stratified sampling technique was used for defining the sampling procedure. An important attribute in encouraging the use of mobile banking was related to costs of inducting banking. Among SMS banking and WAP banking, customers perceived SMS banking to be easier. Significant predictors of adoption turned out to be relative vantage gained, compatibility and perceived complexity of services.\textsuperscript{139}

**Schimmel Kurt (2003)** examined the existence of gender differences regarding the perceptions of the benefits and concerns of shopping online. The study extended the research regarding gender differences in e-commerce by looking at behavior and the possible reasons of the behavior, the perception of the benefits, concerns and important attributes of e-commerce. The results of the research indicated that they were not aggregate significant differences between
men and women regarding the perceptions of the benefits and concerns of E-commerce.

Peter and Bukh (2003) in a study explored the distribution channel strategies chosen by Danish retail banks and aimed at finding out the strategies actually pursued and the connection between chosen distribution channel strategies and other marketing mix elements. Four distribution channels were focused upon viz, branch network, telephone banking, PC banking and internet banking. The study showed that most banks pursue the multiple channel strategy. The author mentioned another area of importance as the employees' attitudes and roles in the transformation from branch banking to internet banking.

Jennifer and White (2003) looked at the customers' attitude and linked this with their usage of financial distribution channels to determine if there were particular attitudinal segments of customers who exhibit similar patterns of access to financial services. Purpose of the study was to investigate whether particular attitudinal variables affected the current usage levels of ATMs, EFT POS, credit cards, cheques, human tellers, internet banking and telephone banking. Analysis of data revealed that particular orientations were related to a financial customers' current level of usage of different financial distribution channels.

Patricio Fisk and Cunha (2003) revealed that performance evaluation was a key factor influencing channel use. Customers tend to use the different service delivery systems in a complimentary way, taking into account their assessment of the advantages and disadvantages of each one. Customer characteristics, and the type of financial operation were also identified as important factors influencing the process. The results indicated that in a multi-channel context, customer satisfaction with internet services depended not
only on the performance of the channel in isolation but also on how it contributed to satisfaction with the overall service offering.\textsuperscript{143}

**Rexha Kingshot and Shang A. (2003)** surveyed bank corporate clients in Singapore and investigated the impact of satisfaction, trust and the use of electronic banking on commitment towards current banks. It was found that trust was the key factor influencing the adoption of electronic banking. Perceived customer satisfaction with the bank only impacted indirectly on the adoption of electronic banking. The cumulative effects of customer satisfaction were found to have a positive impact on trust directed towards the bank, and this greatly impacted on the propensity to use electronic banking. Customer satisfaction, trust, and the use of electronic banking were found to have a positive impact on the corporate clients' commitment towards their bank.\textsuperscript{144}

**Vijayan and Shanmugam (2003)** conducted a study which aimed at evaluating the service quality of internet banking in Malaysia. It focused on the transaction sites of five leading anchor banks which provided a platform for electronic banking and examined performances through a questionnaire. Banks were evaluated on the basis of service quality and were given points based on the institutional nature of reply as well as the promptness of reply.\textsuperscript{145}

**Minjoon and Shaohan (2003)** aimed at providing insights into service quality in the context of emerging internet banking. The study focused on the issues associated with internet banking service quality. It specifically studied what customers perceived to be the key dimensions of internet banking service quality, the dimensions associated with customer satisfaction and what can be recommended to improve customers' perceived internet banking service quality. Some of attributes for customer service quality were identified.\textsuperscript{146}
Shun and Min (2003) introduced perceived credibility as a new factor that reflects the user's security and privacy concerns in the acceptance of internet banking using the technology acceptance model as a theoretical framework. The research aimed at providing insights into how to present the new IT to potential users and providing help to internet banking authorities to develop better user accepted internet banking systems. Findings suggested predicting credibility and explaining the intention of users to adopt internet banking.147

Chang (2003) has examined behaviour of firms (banks) and consumers (banks’ customers) in the event of a new technology (Internet banking) introduction. The determinants of consumer adoption of Internet banking are characterized using survey data from Korea in both static and dynamic framework and found evidence that adoption of Internet banking is influenced by sex, age, marital status, degree of exposure to Internet banking, and the characteristics of the banks. A duration analysis shows no evidence of first mover advantage in Internet banking whilst the largest bank in commercial banking remains dominant in Internet banking. The results imply that social norm effects dominate the Internet banking adoption.148

Aggarwal (2003) There are five key areas in banking where technology has contributed the most: Product Development, Market Infrastructure, Risk Control and Market Research. Online banks can be classified as fully traditional banks, Traditional banks with internet presence and fully Virtual banks. The success of Traditional banks with Internet presence is eminent not only in India but also anywhere in the world. India has an extensive banking network, consisting of rural and urban banks. Largely speaking the most of the Indian banks are still public sector banks. New age private sector
banks like ICICI, HDFC and UTI are fast becoming choice of citizens in urban areas where technology penetration is high.149

Corrocher (2003) investigated the determinants of the adoption of Internet technology for the provision of banking services in the Italian context and also studied the relationship between the Internet banking and the traditional banking activity, in order to understand if these two systems of financial services delivery are perceived as substitutes or complements by the banks. From the results of the empirical analysis, banks seem to perceive Internet banking as a substitute for the existing branching structure, although there is also some evidence that banks providing innovative financial services are more inclined to adopt the innovation than traditional banks.150

Furst et al. (2003) provided a comparative study of Internet and non-Internet banks in U.S. and found that institutions with Internet banking outperformed non-Internet banks in profitability. Also, banks in all categories of size offering Internet banking tended to rely less on interest yielding activities and deposits, than non-Internet banks do in their respective areas.151

Hasan (2003) found that online home banking has emerged as a significant strategy for banks to attract customers. Almost 75 percent of the Italian banks have adopted some form of Internet banking during the period 1993-2000. It also found that the higher likelihood of adopting active Internet banking activities is by larger banks, banks with higher involvement in off-balance sheet activities, past performance and higher branching network.152

Perumal and Shanmugam (2004) provided the boon and bane side of internet banking. According to the authors the boon side of internet banking can be seen through reduced transaction costs, perfect information, geographical reach, faster launch cycles and perfect competition. The bane side of internet banking lied in credit
interest rate risk, liquidity risk, transaction risk, total reliability risk. When integrated with other channels, internet banking became a powerful tool for improving customer satisfaction and increasing cross selling opportunities.\textsuperscript{153}

\textbf{Lee Goi (2005)} studied the opportunities and challenges of e-banking in Malaysia. It was found that Malaysia still has not reached a critical mass to ensure a sustained momentum, which could only be achieved if the nervousness of trading via the Internet was overcome. Technologies were already here; it was the desire and willingness that needed to be converted into action. Malaysian banks would have to develop appropriate e-banking strategies to successfully compete both in the local and global market place. Proper understanding and planning was required to deploy the strategy or service effectively and safely.\textsuperscript{154}

\textbf{Manoharan (2007)} while conducting a research study, highlighted the effect and challenges of e-banking in public and private sector banks. The author said that although, the electronic payment systems in India have evolved, there are still a lot that could be done to increase the usage of electronic payments. Findings suggested that banking industry should provide a reliable legal framework for electronic payments and dispute resolutions process and further recommended that to make it more convenient for users, banks ought to take appropriate steps to accelerate the usage of electronic payment systems in India.\textsuperscript{155}

\textbf{Amin Hanudin (2007)} aimed to study technology acceptance of internet banking among undergraduate students in Malaysia. Thus, the theoretical framework of the paper was based on modified version of Technology Acceptance Model. The results suggested that PU, PEOU and PC had a significant relationship with behavioral intention. Further, these measures were good determinant for undergraduate acceptance for internet banking. The paper is useful
in providing the understanding of the TAM among undergraduate from Malaysians’ perspective.\textsuperscript{156}

**Qureshi Zafar and Bashir (2008)** proposed a study with the basic aim to evaluate the customer acceptance of online banking. Technology was affecting the life of every individual in this present age. Online banking was also one of the technologies which were getting recognition around the globe. There were a lot of customers around the world who were accepting this technology very quickly but in growing countries like Pakistan the adoption ratio was very high. There were many banks which were providing these facilities to customers. The basic purpose of this research was to evaluate the customer acceptance of online banking. Almost 50\% of the clients shifted from traditional banking to online banking system.\textsuperscript{157}

**Nair (2008)** advocated that banking sector is another important sector which is making efforts to move towards paperless environment. The introduction of services like Automated Teller Machines (ATMs) and net banking have proved that the banks are also taking steps in advocating a greener environment. Banks have taken up the responsibility to have as many ATM branches as possible to ensure that people withdraw money directly and this would reduce the usage of cheques. Now, it has become possible for the customers to perform online transactions irrespective of time and place. Creating a paperless environment may not be an easy task. Economy cannot survive without human population and we humans cannot survive if environment does not work in our favour.\textsuperscript{158}

**Kautish (2008)** added that online banking utilizes technology to bypass time consuming aspects of traditional banking. This article witnesses the paradigm shift of banking phenomena from time consuming, paper-based traditional banking to remote banking. **Online banking has changed the face of the entire banking system.** Online banking is a powerful ‘value-added’ look to the banking
system which is used to attract new customers and retain the existing ones.\textsuperscript{159}

\textbf{Sarangapam (2008)} in his study revealed the concept of e-banking and highlights all the concerns and challenges while implementing the same. The traditional model for growth has been through branch banking. Internet banking may be regarded as the latest wave in modern IT. It is a part of virtual banking. The internet service enhances the banks to build their brand image worldwide. The Internet banking products can be offered in a two-tiered structure. The Customer account, inquiry, funds transfer and electronic bill payment come under the basic tier of the Internet banking.\textsuperscript{160}

\textbf{Gupta (2008)} in his study, revealed that almost 70\% of respondents were aware about e-Banking, while 30\% of the respondents were unknown about the facility. Regarding e-banking transactions, 64\% of the respondents were doing transaction through e-banking and only 36\% of them were not transacting. Expectations of customers regarding e-banking depicted that 54\% respondents opined that the easy access should be the most important feature of e-banking, while 32\% opined that ATM was the most important facility from e-banking.\textsuperscript{161}

\textbf{Malik (2009)} highlighted that e-banking is associated with security risks and a breach of security can cause large losses to the bank concerned. Internet is a public network which can be accessed by anybody from anywhere. Data and information which flows through it can easily be accessed even by an unauthorized person with little effort.\textsuperscript{162}

\textbf{Sinha (2009)} advocated that present day banking is primarily driven by innovative technology. Products and services, like ECS, ATMs, RTGS, etc., are indeed consumer-friendly; however, there is a need for depth and breadth in technology transmission. With the advent of technology, irrespective of the employee location, if a
customer has an account with that bank, the salary is credited on the designated date directly into the account of the employees.¹⁶³

**Yahya (2009)** in his study, explored that, about 23% of the online users in India preferred Internet Banking (IB), 53% users preferred ATM, out of 6365 Internet users sampled, 35% preferred online banking channels in India. According to a study carried out by Internet and mobile association of India, it was found that people do not prefer online financial transactions due to many reasons such as security and facilities concerns (45%), preference for face-face transactions (39%), lack of knowledge (22%) and lack of users friendliness of the channels (10%).¹⁶⁴

**Rai (2010)** said that thirty two banks, including major public, private and foreign banks offer mobile banking services and some banks like State Bank India are working on a technology to support low end and entry-level handsets for such transactions. Mobile phones can be used for transactions ranging from mobile recharges and buying film tickets to paying electricity bills, air tickets & hotel stay charges etc. But one has to register himself for payment through his mobile and get a Mobile PIN to authenticate such transactions. The banks eliminate the need for customers to go to an ATM or approach a teller in the branch.¹⁶⁵

**Prasad (2010)** in his research article explored that Indian banks have spent crores of rupees to provide electronic channel banking and invested heavily to improve the Information Technology systems. Various studies on banks profitability also reported that the Indian Banking Profitability is mainly from Retail Banking Sector. E-Channels are part of retail banking and play a major role in reducing the cost of operations in the retail banking segment. The author advocated the usage of various e-channels by the retail users based on the demographic differences and compared the products offered by ICICI and HDFC banks.¹⁶⁶
Srivastava (2010) added that in India, mobile phone banking is fast catching up as a cost-effective alternative banking model. It is like a virtual banking model. Mobile banking could pave the way for a greener society, with the progressive elimination of cash transactions. The use of a mobile phone to make payments and carry out other banking transactions is called Mobile Phone Banking. M-Banking is fast emerging as a major driver to adopt wireless technology in rural areas in developing countries. M-Banking can help banks and microfinance institutions to deliver and collect credit in a faster and cheaper way. Besides, it help in better credit management.

Chakrabarty (2010) predicted that the banking sector is clearly set for some changes. He revealed that more competitions are good and the government is considering to give more new banking licenses. The financial system is becoming increasingly inter connected and problems in one part of the sector can quickly transmit to other corners causing systematic instability.

Reporter (2010) from Business Standard, highlighted that foreign banks are unlikely to get banking licenses to make stand in Indian banking industry. Various global banks are going slow on overseas expansion due to their own stress in their home markets. The author revealed that the RBI would issue fresh guidelines on the eligibility criteria for outside investors.

Kochhar (2010) a chief executive officer cum managing director, ICICI, said that banking was a very complex business which need to determine the procedure for giving additional licenses to make the banking services available at every village of the country. The Deputy Governor of RBI is also of the opinion that eligibility criteria would be worked out and appropriate measures shall be taken to provide the financial stability.

Bandyopadhyay (2010) in his editorial published in Mint newspaper said that in a country where fifty per cent of the
population do not have access to banking services, Reserve Bank of India should have given opportunities to new non-banking finance companies. The history and performance of new generation private banks can be helpful to identify the right choice for issuing licenses. The government has promised to set-up a financial sector legislative reforms commission to clean the financial sector laws and make them productive.171

Girimaji (2010) while emphasizing the importance of financial inclusion for sustained and long-term development, Union Finance Minister Pranab Mukherjee, promised to provide the banking services in each of the unbanked blocks of the country and the government want that their citizens enjoy the benefits of the expansion in the banking network. The minister reiterated that it has to be seen that banks develop a healthy respect for the rights of the customers and implement stringently the laws meant for the protection of the interests of their clients.172

Singh (2010) highlighted that there is common perception that PSBs cannot compete with new generation private sector banks in terms of information, communication technology and innovative products which is playing a vital role in attracting more business, whereas the staff of the PSBs has grown at a faster pace than their counter parts in the banking industry. The author revealed that PSBs increased their branch network by 2%, their staff strength has fallen by one percent. In order to sustain this productivity, the focus on technology should be continued with great vigor so as to add value to customer service, develop new products, strengthen risk management and improve profitability.173

Tessmer (2012) emphasized the need to investigate the environment in which the potential adopter is expected to use the technology. The approach is intended to ensure actual, correct and continual product use. This process includes identifying the relevant
physical characteristics of both the instrumental situation and the support system. No such approach or process may be sufficient to ensure successful innovation adoption. It should focus on the potential adopter and address their characteristics in the context of the environment in which they will be using the technology.\textsuperscript{174}

**Reserve Bank of India (2013)** while taking initiatives on cooperation, set up a supervisory college comprising state bank of India from public sector bank, and ICICI bank from Private sector bank, the two biggest banks, with the objective to deal with issues revolving around these banks and establish a cooperation mechanism for cross border supervision. SBI and ICICI banks were chosen because they have a large cross border presence.\textsuperscript{175}

**Inferences drawn from Literature Review**

The review of the literature on the subject indicated that the concept of Information Technology in its present form is new and the introduction of IT is very vital for the present banking system. Some articles in the leading newspapers, magazines & journals have highlighted the importance of IT in banking industry. During extensive literature review, author came across studies regarding staff productivity, bank profitability, technological reforms in banking sector, factors affecting adoption of internet banking/choice of bank, effects of service quality of banking services etc. But most of these studies were conducted in foreign countries such as Australia, Malaysia, US, UK, Ireland, Italy, Republic of Croatia, Korea, Singapore, China, Saudi-Arabia, North America, South Africa, Botswana, Sultan of Oman etc. There are a few studies conducted in India about perceptions of customers about banking services, cost & profitability, nature and range of customer services, abuse of bank facilities, awareness about benefits of credit cards, ATMs, etc. in isolation. But no comprehensive study has yet been conducted on E-banking in totality, with vast scope covering E-banking channels
and covering major public/private sector banks along with customer satisfaction as well as employee perception regarding the impact of IT on banking industry.

NEED OF THE STUDY

In traditional banking, there was a lot of wastage of time, energy and paper work. With the advancement in science and technology, the banking sector has made a tremendous progress over the last decade and is competing with others in the global market. The innovative trends like mobile banking ATMs, Internet banking and tele-banking etc. has taken over the conventional channels of delivery of services and the customers and bank officials have saved time, energy and paper work. The customer can avail services just on one touch of the key board and need not go anywhere outside.

Today customers have become more educated, they demand new products, better delivery channels and more reliable and responsive services. Therefore, maintaining high quality customer service has become one of the indispensable components of the overall strategy to sustain profitable long-term relationships.

With the advent of E-Banking, the whole scenario of banking has changed. Therefore, there is a great need to study IT related innovations in banking such as E-banking. All the more important is to study the extent to which the customers are satisfied with the delivery of these E-services and there arises an urgent need to study the banking from the customer's perspective. Moreover, the research will be incomplete if the perception of bank officials are missed out, because, the quality of services are greatly dependent upon the perception of officials.

Therefore this study is concerned with mainly two aspects i.e, satisfaction level of customers and perception of employees with selected E-services of selected Public and Private sector banks.
SCOPE OF THE STUDY

There are a large number of banks in India, in fact, most of the banks have adopted these latest trends in banking because of its vast applicability, extensive use in the day-to-day banking and increasing competition. But, the present study is limited to four banks only. Out of these, two are Public sector banks (State Bank of India and Punjab National Bank) and two are Private Sector Banks (ICICI Bank and HDFC Bank).

I have chosen these banks because I wanted to study the adoption and level of satisfaction from selected E-services among the bank customers as well as the perception among the bank officials, regarding the selected E-services, both in, Public Sector Banks as well as Private Sector Banks.

Out of all banks under these categories, I have selected these four banks because they are the top performers under the respective categories of public sector banks and private sector banks.

STATEMENT OF THE PROBLEM

Satisfaction Level of E-Services : A comparative study of Public and Private sector banks

OBJECTIVES OF THE STUDY

(i) To study the selected E-services provided by selected public sector and private sector banks under study.

(ii) To examine the level of satisfaction of customers regarding selected E-services in selected public sector and private sector banks under study.

(iii) To examine the perception of the bank officials regarding E-services in selected public sector and private sector banks under study.

(iv) To make comparative analysis of level of satisfaction, among customers, regarding selected E-services in
selected public sector and private sector banks under study.

(v) To make comparative analysis of the perception of the bank officials, regarding selected E-services in selected public sector and private sector banks under study

SAMPLE DESIGN & SAMPLE SIZE

In this study, sample of 100 Bank officials and 400 Customers have been taken. All these bank officials and customers have been selected by quota sampling technique from selected public & private sector banks situated in Chandigarh. In the category of Public sector banks, SBI & PNB have been selected and among Private sector banks, ICICI & HDFC have been selected, as these banks were the top performers under their respective categories.

SOURCES OF DATA

This study has been based mainly on primary data. A preliminary survey was made and information was obtained from the bank officers concerned, regarding the selected E-services provided by their banks.

On the basis of information thus obtained, two types of Interview schedules were prepared, one for the bank officials and other for the customers. These schedules were validated from bank officials and customers and then modified accordingly. Then these schedules were pretested to check their reliability and after that the final schedules were prepared for study.

The schedule for the bankers consisted of ten questions. These questions were formulated to know the opinion of officials regarding the available E-services, the enquiries made by the customers about E-services, the reasons of preference for E-services, as well as conventional banking system, the impact of E-services on the performance of bank under different parameters, and their complaint
receiving & resolving system. Last question of the schedule relates to the particulars of the bank officials (Annexure - II).

The Interview Schedule for Customers consisted of 22 questions which includes questions related to four selected E-channels, the reasons of preference for their respective bank, the E-channels used by customer, the type of services being used by them under each category of E-channel, the reasons for using the respective E-services, the level of satisfaction with the E-services being used by them. The Schedule also tries to assess the frequency of usage of the selected E-services, the problems faced while using any of the E-services, the complaints made by them and the time taken by bank to solve the problem. The satisfaction level regarding complaint redressal system of banks was also sought for. It also asked about, whether the customer will recommend the bank for its E-services. (Annexure - I)

The secondary data was collected from annual reports & other published literature of banks (such as, magazines, circulars & monthly information bulletins etc), RBI bulletins, Economic Surveys, Newspapers, Internet and other published data.

Final survey was made in the following branches of banks in Chandigarh:

**State Bank of India**

1. Sector-14, Panjab University
2. Sector – 17B, Main Branch
3. Sector – 22C
4. Sector – 7, Madhya Marg

**Punjab National Bank**

1. Sector – 17B
2. Sector – 22B
3. Sector – 9D, Madhya marg
4. Sector- 12, Punjab Engineering College
ICICI Bank

1. Sector – 9D, Madhya marg
2. Sector – 35C
3. Sector – 17B
4. Sector- 26

HDFC Bank

1. Sector – 17C
2. Sector – 22 B
3. Sector – 35 B
4. Sector – 8C, Madhya marg

Statistical Analysis

The data, thus collected has been coded and analysed using different statistical methods such as Kruskal Wallis Test, Mann Whitney Test and Pearson Chi-square test.

Chapterization

Chapter I: Introduction, Review of Literature and Research Methodology.

Chapter II: Profile of selected Banks.

Chapter III: E-services – Satisfaction level of Customers.

Chapter IV: E-services – Perception of Bank Officials.

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