CHAPTER – I

INTRODUCTION AND DESIGN OF THE STUDY

1.1 Introduction

The wind of liberalisation sweeping through India has affected all sectors of the economy and the centre of all these activities is the Indian Banking industry. In such a fast changing environment, to meet emerging needs, the operations in banks need immediate automation to provide services comparable to best international standards and to match technological changes taking place in other countries. Indian banks undertook very little efforts for modernization in respect of work technologies particularly in the areas of introduction of computers and communication networks until the early 1980s.

In India, the first banks were Bank of Hindustan (1770-1829) and The General Bank of India, (1786). They had become defunct. The largest and the oldest bank still in existence, is the State Bank of India. It originated in the Bank of Calcutta in June 1806, which almost immediately became the Bank of Bengal. This was one of the three presidency banks, the other two being the Bank of Bombay and the Bank of Madras. All the three banks were established under charters from the British East India Company. The three banks merged in 1921 to form the Imperial Bank of India, which, upon India’s independence, became the State Bank of India in 1955. For many years the presidency banks acted as quasi-central banks, as did their successors, until the Reserve Bank of India was established in 1935.

In 1969 the Indian government nationalised all the major banks that it did not already own and these have remained under government ownership. They are run under a structure
known as ‘profit-making Public Sector Undertaking’ (PSU) and are allowed to compete and operate as commercial banks. The Indian banking sector is made up of four types of banks, such as the PSUs, the state banks, new private commercial banks and a number of foreign banks.

Banking in India was generally fairly mature in terms of supply, product range and reach—even though reach in rural India and to the poor still remains a challenge. The government has developed initiatives to address this through the State Bank of India expanding its branch network and through the National Bank for Agriculture and Rural Development (NABARD) with schemes like microfinance.
1.1.1 Expansion of Banking Infrastructure

As per Census 2011, 58.7% households availed banking services in the country. There are 102,343 branches of Scheduled Commercial Banks (SCBs) in the country, out of which 37,953 (37%) bank branches are in the rural areas and 27,219 (26%) in semi-urban areas, constituting 63% of the total number of branches in semi-urban and rural areas of the country. However, a significant proportion of the households, especially in rural areas, are still outside the formal fold of the banking system. To extend the reach of banking to those outside the formal banking system, Government and Reserve Bank of India (RBI) have been taking various initiatives from time to time and some of which are enumerated below:

a. Opening of Bank Branches

The government issued detailed strategy and guidelines on Financial Inclusion in October 2011, advising banks to open branches in all habitations of 5,000 or more population in under-banked districts and 10,000 or more population in other districts. Out of 3,925 such identified villages/habitations, branches have been opened in 3,402 villages/habitations (including 2,121 Ultra Small Branches) by the end of April, 2013. Banks have been advised to ensure banking services in rural areas and have been assigned the responsibility in specific wards in urban areas to ensure that every household has at least one bank account.

b. Business Correspondent Model

With the objective of ensuring greater financial inclusion and increasing the outreach of the banking sector, banks were permitted by the RBI in 2006 to use the services of intermediaries in providing financial and banking services through the use of Business Facilitators (BFs) and Business Correspondents (BCs). Business correspondents are retail agents engaged by banks for providing banking services at locations other than a bank branch/ATM.
BCs and the BC Agents (BCAs) represent the bank concerned and enable a bank to expand its outreach and offer limited range of banking services at low cost, particularly where setting up a brick and mortar branch is not viable. BCs as agents of the banks, thus, are an integral part of the business strategy for achieving greater financial inclusion. Banks had been permitted to engage individuals/entities as BCs like retired bank employees, retired teachers, retired government employees, ex-servicemen, individual owners of kirana/medical/fair price shops, individual Public Call Office (PCO) operators, agents of Small Savings Schemes of Government of India, insurance companies, etc.

Further, from September 2010, RBI had permitted banks to engage companies registered under the Indian Companies Act, 1956, excluding Non-Banking Financial Companies (NBFCs), as BCs in addition to individuals/entities permitted earlier. According to the data maintained by RBI, as in December, 2012, there were over 152,000 BCs deployed by Banks. During 2012-13, over 183.8 million transactions valued at ₹165 billion (US$2.8 billion) had been undertaken by BCs till December 2012.

c. Swabhimaan Campaign

Under "Swabhimaan" - the Financial Inclusion Campaign launched in February 2011, banks provided banking facilities. Further, in terms of Finance Minister's Budget Speech 2012-13, the "Swabhimaan" campaign has been extended to habitations with population of more than 1,000 in North Eastern and Hilly States and to habitations which have crossed population of 1,600 as per census 2001. About 40,000 such habitations have been identified to be covered under the extended "Swabhimaan" campaign.

d. Setting up of Ultra Small Branches (USBs)

Considering the need for close supervision and mentoring of the Business Correspondent Agents (BCAs) by the respective banks and to ensure that a range of banking
services are available to the residents of such villages, Ultra Small Branches (USBs) are being set up in all villages covering through BCAs under Financial Inclusion. A USB would comprise of a small area of 100 sq ft (9.3 m$^2$) - 200 sq ft (19 m$^2$) where the officer designated by the bank would be available with a laptop on pre-determined days. While the cash services would be offered by the BCAs, the bank officer would offer other services, undertake field verification and follow up on the banking transactions. The periodicity and duration of visits can be progressively enhanced depending upon business potential in the area. A total of over 50,000 USBs have been set up in the country by March, 2013.

e. Banking Facilities in Unbanked Blocks

All the 129 unbanked blocks (91 in North East States and 38 in other States) identified in the country in July 2009, had been provided with banking facilities by March 2012, either through Brick Mortar Branch or Business Correspondents or Mobile van. As a next step it has been advised to cover all those blocks with BCA and Ultra Small Branch which have been so far covered by mobile van only.

f. USSD Based Mobile Banking:

National Payments Corporation of India (NPCI) worked upon a "Common USSD Platform" for all banks and telcos who wish to offer the facility of Mobile Banking using Unstructured Supplementary Service Data (USSD) based Mobile Banking. The Department helped NPCI to get a common USSD Code *99# for all telcos. More than 20 banks have joined the National Uniform USSD Platform (NUUP) of NPCI and the product has been launched by NPCI with BSNL and MTNL. Other telcos are likely to join in the near future. USSD based Mobile Banking offers basic Banking facilities like Money Transfer, Bill Payments, Balance Enquiries, Merchant Payments etc. on a simple GSM based Mobile phone, without the need to download application on a phone as required at present in the IMPS based Mobile Banking.
1.1.2 Information Technology in banking sector

The IT revolution has had a great impact on the Indian banking system. The use of computers has led to the introduction of online banking in India. The use of computers in the banking sector in India has increased manyfold after the economic liberalisation of 1991 as the country's banking sector has been exposed to the world market. Indian banks found it difficult to compete with the international banks in terms of customer service, without the use of information technology.

Rapid development of business and industry brought manual operations of data, to a saturation point. This acted as a overload on the growing banking operations. In general the government owned banks found the "house-keeping" unmanageable. In particular, several heads of accounts inter-bank clearing and inter-branch reconciliation of accounts went totally out of control. Low productivity pushed cost of wages higher and employees realised that unless they agreed for computerisation further improvement in their wage structure would not be possible. In the year 1993, the Employees' Unions of Banks signed an agreement with Bank Managements under the auspices of Indian Banks' Association (IBA). This agreement was a major break-through in the introduction of computerised applications and development of communication networks in banks.

The first initiatives in the area of bank computerisation, however, stemmed out of the landmark report of the two committees headed by the former Governor of the Reserve Bank of India and currently Governor of Andhra Pradesh, His Excellency, Dr.C.Rangarajan. Both the reports strongly recommended computerisation of banking operations at various levels and suggested appropriate architecture. In the seventies, there was a four-fold increase in the number of branches, five-fold increase in advances and a six-fold increase in deposits. Mechanisation was seen as the best solution to the problems inherent in the manual system of operations, their adverse impact on customer services and the grave dangers to banks in the context of increasing incidence of frauds.

The first of these Committees, viz. the Committee on the Mechanization of the Banking Industry (1984) was set up for the first time to suggest a model for
mechanisation of bank branches, regional / controlling offices and Head Office necessitated by the explosive growth in the geographical spread of banking followed by the nationalization of banks in 1969. In the first phase of computerisation spanning the five years ending 1989, banks in India had installed 4776 ALPMs at the branch level, 233 mini computers at the Regional/Controlling office levels and trained over 2000 programmers/systems personnel and over 12000 Data Entry Terminal Operators. The Reserve Bank too had embarked upon an ambitious program to bring about state-of-the-art technology in the clearing process and had introduced MICR clearing at 4 centres and computerized clearing settlement at 9 centres.

Against this backdrop, the Committee on Computerisation in Banks was set up once again under Dr. Rangarajan's Chairmanship to draw up a perspective plan for computerisation in banks. In its report submitted in 1989, the Committee acknowledged the gains of the initial efforts and sought to move away from the stand-alone dedicated systems to an on-line transaction processing environment in branch banking. It recommended that the thrust of bank computerisation for the following 5 years should be to fully computerise the operations at both the front and back offices of large branches then numbering around 2500.

1.1.3 Progress Made after the Report of the Second Committee

Computerisation efforts among the Public Sector Banks (PSBs) in India, which account for over 80 per cent of the assets of the entire banking system, have been substantial. Of the 45,439 branches of the PSBs as on September 30, 1998, as many as 3,668 branches serving customers directly had been fully computerised with a complement of more than 65,000 computer nodes/PCs. A total of 6961 branches have been partially computerised - with Advanced Ledger Posting Machines, Electronic Accounting Machines and Personal Computers. Of the 336 service branches, 149 had been fully computerised and 166 had been partially computerised.
The PSBs had installed 194 Automated Teller machines (ATMs) all over the country; they had issued over 8.5 lakh credit cards and over 32,000 debit cards. The latest in this area of activity has been the issue of SMART cards. For international interconnectivity of computers and for cross-border transactions, 568 branches have been connected to the \textit{Society for Worldwide Inter - bank Financial Telecommunication (popularly known as S.W.I.F.T)}. Local Area Network of branches has been established at 571 branch locations using internal captive networks while 148 branches are on the RBINET.

The Reserve Bank then identified the Payment Systems area as a thrust region for computerisation in banks. The Bank has constituted a Payment Systems Advisory Committee and an operational group to make policy guidelines. The payment systems which constitute the arteries of any economy has been recognised as the focus area for this group. This group was asked to consolidate the existing payment systems, developing new, technologically advanced modes of payments and integration of different payment and settlement systems into an efficient, integrated system that will function as a Real Time Gross Settlement (RTGS) in an on-line environment.

To facilitate these objectives, a Computer based network has also been established. This Wide Area Satellite Based network, called the \textit{Indian Financial Network (INFINET)} aims at connecting computers at branches of banks. 479 branches at commercially important cities are to be connected to the INFINET in the first phase while the next phase would witness the coverage being extended to about 5000 branches.

The INFINET is a robust and secure network which would be used for effecting financial fund movements and important information flow within the country. In view of the sensitive nature of the transactions to be routed through the network and to make it totally secure, the usage of the network would be restricted to a 'Closed User Group' consisting of member banks and financial institutions only. The INFINET User Group is engaged in various aspects pertaining to the Payment Systems in the country including the issues related to security over the network, encryption and decryption of messages.
during transmission, standardisation of message formats, exchange of encryption keys etc.

1.1.4 Recommendations of Committee on Technology Upgradation

The Reserve Bank continued to be involved in shaping the technological vision of the banking system. Following the recommendations of the Committee on Financial Sector Reforms, (which is popularly known as the second Narasimham committee), a Committee on Technology Upgradation was set up by the RBI for the Banking Sector in 1994. This committee has representation from banks, Government, technical institutions and the RBI. Among other things, this committee looked into issues relating to

i. Encryption of Public Switching Telephone Network (PSTN) lines

ii. Admission of electronic files as evidence

iii. Record keeping

iv. Modalities for a satellite based WAN for banks and financial institutions with the necessary security systems by banks and other financial institutions, to ultimately develop a sound and an efficient payments system

v. Methods by which technological upgradation in banks and financial institutions could be effected and in the context, study the feasibility of establishment of standards, designing payments system backbone and standards relating to security levels, messages and smart cards.

The Committee realised the urgent need for training, research and development activities in the Banking Technology area. Banks and Financial Institutions started setting up Technology - based training centres and colleges. However, a need was felt for an apex level Institute which could be a Think-tank and Brain Trust for Banking Technology

The committee recommended a variety of payment applications which can be implemented with appropriate technology upgradation and development of a reliable communication network. The committee also suggested setting up of an Information Technology Institute for the purpose of Research and Development as well as Consultancy in the application of technology to the Banking and Financial sector of the
country. As recommended by the Committee, IDRBT was established by RBI in 1996 as an autonomous centre for Development and Research in Banking Technology at Hyderabad.

1.1.5 Institute for Development and Research in Banking Technology (IDRBT)

IDRBT is engaged in a number of Research Projects to improve Banking Technology in India. The Institute is concentrating on four major areas of Research as follows:

i. Financial Network and Application Architecture
ii. Payments System and Security Technology
iii. Multimedia, Internet Technologies and Web Based Learning
iv. Data Mining, Data Warehousing and Risk Management

IDRBT is also collaborating with Academic Institutions and Research Organisations in India and abroad for the purpose of promoting higher education, research and development in Banking Technology in India. The Institute is actively involved in the development of various standards and systems for Banking Technology, in coordination with the Reserve Bank of India, Indian Banks’ Association and the various high-level committees constituted at the industry and national levels. Apart from investing most of its time and resources in Research and Development, the Institute also offers Consultancy in I.T. and related areas to Banks and other Financial Institutions. Certification Management for e-commerce and Electronic Payment Systems, Real Time Gross Settlements, Data Warehousing and Data Mining for Banks, Intrusion Detection Systems, Computer Based Training and Web Based Learning are some of the primary projects on which IDRBT teams are now working and offer consultancy to Banks and Financial Institutions. The Institute has already established leadership in VSAT Networks and Corporate Network Design.

1.1.6 Computerised Services of RBI
The following are the computerised services introduced by the RBI.

**a. Mechanised Cheque Processing System using MICR Technology**

The term "MICR" stands for Magnetic Ink Character Recognition, and is used to describe the line of numbers and special characters that appear at the bottom of every check. Since the 1940s, banks have speeded check processing with special devices that “read” the MICR encoding and translate the characters into the account number and other pertinent information. The Magnetic Ink Character Recognition (MICR) technology based cheque processing was first introduced in Mumbai and Chennai in 1987 by the Reserve Bank of India and gradually extended to Delhi in 1988 followed by Kolkata in 1989.

**b. Electronic Data Interchange (EDI)**

The Ministry of Commerce, Government of India has identified 114 centers as major export / import intensive centers in the country. The Ministry desired that, at all these centers, the bank branches should be fully computerised, inter-connected and networked and there should be inter-bank connectivity so that on-line banking facility could be made available to the exporter-importer customers. The Department of Commerce in the Ministry of Commerce & Industry, Government of India, New Delhi is the nodal agency for overseeing implementation of Electronic Commerce (EC)/ Electronic Data Interchange (EDI) in the various organisations in the country.

Banks are one of the agencies entrusted with the responsibility for implementing EC/EDI. The Indian Banks' Association is coordinating the implementation of the EC/EDI in the various banks as per the directives of the Ministry of Commerce and Industry. Currently, 11 Public Sector Banks at 28 locations in the various airports / seaports are implementing the Banks- Customs EDI Project.
c. Electronic Funds Transfer (EFT) System

As part of the initiatives aimed at quick movement of funds in a paperless mode, the Reserve Bank of India had introduced the Electronic Funds Transfer System (EFT) in the year 1996 for quick movement of funds between different banks for the bank customers. Currently, the scheme is available for transfer of funds across 8,500 branches of banks at 15 centres where Reserve Bank of India manages the Clearing House (Ahmedabad, Bangalore, Bhubaneswar, Chandigarh, Chennai, Guwahati, Hyderabad, Jaipur, Kanpur, Kolkata, Mumbai, Nagpur, New Delhi, Patna and Thiruvananthapuram). The facility is available for transfer of funds for individual transaction up to Rs.2 crore per transaction with effect from 1st October, 2001.

d. Advantages of EFT

The Reserve Bank of India is considering a proposal to utilise State Bank of India's clearing houses to increase the reach of Electronic Fund Transfer (EFT) facility in the country. EFT is the safest and fastest way to transfer money from your account to another individual in another city regardless of which bank he/she uses. All the transferors need their account number. A maximum of Rs.0.1mn can be transferred for a flat fee of Rs.25. The bank has discretionary powers to raise the limit for select customers or a customer can break up the transactions into multiples of upto Rs.0.1mn. The money sent is credited overnight and can be withdrawn by the receiver the day after transfer.

Disclosing other advantages of the EFT, an official of the IBA's Department of Information Technology, says, "The facility can be availed even if the branch from where you are sending the amount is not fully computerized. The details of the transfer have to be sent to the RBI which in turn notifies the receiving bank to credit the individual with the mentioned amount." Being the largest bank, SBI has the maximum number of clearing houses across the country. A tie-up with SBI's clearing houses will enable RBI to expand the Electronic Fund Transfer facility, said sources. The RBI will provide the EFT software to SBI's clearing houses. The tie-up with SBI will enable the central bank to provide Electronic Fund Transfer facility to almost every district in the country.
The EFT facility, a software package developed by RBI, can run even on a Windows platform. It was developed in 1996 and is becoming increasingly popular with over 50 banks having implemented it. EFT enables fund transfer from any branch of any bank, which is a member of the EFT system to any branch of any bank within 24 hours. This includes both inter-city, intra-city and also inter-bank and intra-bank. EFT was first tested between Chennai and Mumbai. The year 1997 saw the EFT facility expanded to all metros and in 2002 over to 15 centres in a phased manner. EFT is primarily aimed at retail transactions with a maximum amount permitted at Rs 2 Crore. The NCC collects a mere Rs.5 per transaction. The RBI gives the software free of charge to banks for faster processing of transactions and minimising paper based processing.

Simultaneously, the importance of effective MIS for control of operations and of maintaining customer and business/industry data bases for strategic planning has also surfaced; while Banks are looking at Data warehousing, Data mining, Business Restructuring etc. as most essential things to have as early as possible, they are taking urgent steps to computerise the operations in their administrative and controlling offices (viz. head /zonal/regional offices) as well as the data collection machinery, so as to evolve an effective MIS. In this phase, the new communication revolution sweeping the nation and the world has come in extremely handy, as the communication infrastructure has improved significantly and the Internet technologies are available to network branches at a relatively low and affordable cost with a high degree of reliability.

1.2 Scope of the study

Timely adoption of Electronic-banking is significant for all banks to have secure future business. Banks are facing extremely intensive competition from non-banking sector, thus they have adopted a more aggressive approach to fight competitors for financial services’ market share. As bank wants to move very nearer to the customers, increase its basic operational strategies, move towards international trade, need of quick transfer of money, which motivated
researchers to introduce a new structure and era i.e. Electronic Banking. E-Banking referring to all banking transactions completing through internet applications has become a hot topic in the related literature. The Banking Industry is stepping ahead by adopting new technology and creating new milestones in this competitive World.

1.3 Statement of the problem

Information technology is considered as a key factor for the changes taking place around the world. Electronic banking is the most inventive service offered by the banks. The transformation from traditional banking to e-banking has been a dramatic change. The evolution of e-banking started from the use of Automatic Teller Machines and Telephone Banking (ATM), direct bill payment, Electronic Fund Transfer (EFT) and the revolutionary online banking. This study determines the consumers’ perspective on the adoption of e-banking. There will be huge acceptance of e-banking with the passage of time with growing awareness and education. Many people are shifting to e-banking and have readily accepted the usefulness of this option. It allows customers to manage their accounts from any place, at any time at minimum cost. Electronic banking is the latest in the series of technology wonders in the recent past, involving use of internet for delivery of products and services.

The electronic banking has been evolving the environment with the development of the World Wide Web. Banks through internet has emerged as a strategic resource for achieving higher efficiency. More recently in India, the E-banking service is carried out in an effective way to satisfy the customers of the respective banks. As time factor is very much important for all the people in this modernized world, a present customers do not want to waste their precious time for waiting in a queue. The electronic revolution has made it possible to provide ease and flexibility in banking operations which benefit the customers. As a business tool, internet banking is rapidly transforming the world of commerce and banking, making banks faster and more efficient and allowing them to provide more personalized services to the user /customer. The internet creates perfect market conditions where customers have access to more
information and can compare rates and financial products offerings. Internet reduces the barriers to enter many banks have found that internet banking has actually added to the cost.

The present study analyses customers’ attitude towards e-banking services of public sector banks in Madurai District. The research objective is to investigate various factors influencing customers’ perception and satisfaction level towards e-Banking. It further throws light on types of e-Banking services, certain emerging issues and challenges, benefits available to them and the factors influencing the decision of the customers towards the e-Banking services of public sector banks.

1.4 Objectives of the study

The following are the objectives of the study.

1. To study the relationship between the socio economic variables of the respondents and their attitude towards the e-banking services of public sector banks.
2. To measure the determinants of the attitude of the customers towards the e-banking services.
3. To examine the factors influencing the customers to avail e-banking services of public sector banks in the study area.
4. To analyse the difficulties of the customers in availing the e-banking services of the public sector banks.

1.5 Hypotheses

To achieve the above objectives the study following null hypotheses are framed.

a. Socio-economic variables of the respondents and their attitude towards e-banking services are independent in nature.

b. There is no impact of socio-economic variables of the respondents on the attitude towards the e-banking services.
c. Customers of public sector banks have same level of opinion about the e-banking services of public sector banks.

d. There are no problems in availing the e-banking services of public sector banks.
1.6 Research design and Methodology

The present study is both descriptive and analytical in nature. In order to analyse the research problem undertaken for the study, primary data is considered to be the most appropriate one. The emphasis is on describing rather than on judging or interpreting. The aim of the descriptive research is to verify the formulated hypotheses that refer to the present situation in order to elucidate it. Moreover, the descriptive approach is quick and also flexible for making decision.

1.6.1 Research instrument

For the purpose of studying the objectives of the study and testing the hypotheses, interview schedule is used as an instrument to collect data from the selected customers in the study area. The instrument is divided into four parts so as to fulfil the objectives of the study. The first part captures the socio-economic details of the respondents and their account details, followed by the opinion about need of e-banking services, difficulties in adopting e-banking services and attitude of the customers towards e-banking services under eight dimensions namely i. ease of use, ii. usefulness, iii. economy, iv. self control on account v. functional value, vi. emotional value, vii. trust value and viii. loyalty value. The items that capture each part are partly developed by the researcher and partly adopted from standardized questionnaires developed and used in the earlier research work. These items and factors under study are finalised by the researcher after conducting pre-test and reliability test.

1.6.2 Pre-test

The face and content validity of the instrument is conducted with five experts. The experts are requested to offer their feedback and suggestions on each of the items. Based on their feedback, it is found that all the items developed by the researcher are found to have adequate validity in gathering the details regarding the attitude of the customers towards e-banking services.
services. Finally, a few statements are simplified so as to enable the respondents to understand it better. Then pre-test is conducted with a few customers in the study area and from the results it is found that the interview schedule is suitable for collection of data from the respondents.

1.6.3 Pilot study

The researcher has conducted pilot study after finalizing the number of items in the research instrument using face and content validity tests. To conduct the pilot study, 30 respondents who are using the e-banking services of public sector banks in the study area are identified and data is collected. The researcher also had discussions with the respondents in general about the stimulus generated by the interview schedule in furnishing unbiased and unprejudiced response for all items.

1.6.4 Results of the pilot study

The exact responses of the respondents of pilot study are analysed and the results of the pilot study resulted in the formulation of objectives of the study. Moreover, the discussions with the respondents during the pilot study revealed that the instrument had adequate stimulus value to gather authentic responses from the respondents. Hence, it is concluded that the instrument used in the study would elicit the necessary data required from the respondents.

1.6.5 Reliability test

The data collected from the pilot study is subjected to reliability test using Cronbach Alpha.

<table>
<thead>
<tr>
<th>Table 1.1</th>
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<tr>
<td>Reliability Coefficients using Cronbach Alpha</td>
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<p>| xxxvi |</p>
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimensions</th>
<th>Reliability Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Opinion about need for e-banking</td>
<td>0.81</td>
</tr>
<tr>
<td>2.</td>
<td>Difficulties in adopting e-banking services</td>
<td>0.76</td>
</tr>
<tr>
<td>3.</td>
<td>Opinion about convenience of e-banking services</td>
<td>0.68</td>
</tr>
<tr>
<td>4.</td>
<td>Opinion about benefits of e-banking services</td>
<td>0.78</td>
</tr>
<tr>
<td>5.</td>
<td>Opinion about economy of e-banking services</td>
<td>0.71</td>
</tr>
<tr>
<td>6.</td>
<td>Opinion about self-control of e-banking services</td>
<td>0.86</td>
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<tr>
<td>7.</td>
<td>Opinion about functional value of e-banking services</td>
<td>0.74</td>
</tr>
<tr>
<td>8.</td>
<td>Opinion about emotional value of e-banking services</td>
<td>0.83</td>
</tr>
<tr>
<td>9.</td>
<td>Opinion about trust value of e-banking services</td>
<td>0.68</td>
</tr>
<tr>
<td>10.</td>
<td>Opinion about loyalty value of e-banking services</td>
<td>0.77</td>
</tr>
</tbody>
</table>

From the table 1.1, it is found that the reliability coefficients for the variables chosen for this study are more than 0.60, which is an acceptable value. So, the items constituting each variable in the interview schedule has reasonable internal consistency.

This following section describes the methodology which includes data collection, period of the study, sampling design, method of analysis and tools of analysis. Since the present study is descriptive and analytical in nature both primary and secondary data have been used.

1.6.6 Primary Data

The primary data required for the study were collected with the help of interview schedules. Pre-test was conducted before undertaking the survey. In the light of the pre-test, the interview schedule was modified and restructured. The interview schedule consists of three parts. The first part relates to the socio-economic background of the respondents. The second part comprises of factors which influenced to adopt e-banking services and difficulties in adopting e-banking services and third part covers the statements on various dimensions of attitude of the customers towards e-banking services of public sector banks.

1.6.7 Secondary Data

The secondary data required for the present study are collected from the standard text books, journals, reports, records and websites.
1.7 Determination of Sample Size

The sample size of the present study is determined by using G Power 3.1. For social science researches power (1-β err prob) 0.85 is applied. The details of sample size calculated for the various parametric and non parametric tests using G Power 3.1 is presented in the following table.

Table 1.1

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>α err prob</th>
<th>Power (1-β err prob)</th>
<th>Total Sample Size</th>
</tr>
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<tbody>
<tr>
<td>Z - Test</td>
<td>0.15</td>
<td>0.85</td>
<td>495</td>
</tr>
<tr>
<td>ANOVA</td>
<td>0.15</td>
<td>0.85</td>
<td>201</td>
</tr>
<tr>
<td>Regression</td>
<td>0.15</td>
<td>0.85</td>
<td>142</td>
</tr>
<tr>
<td>Chi Square Test</td>
<td>0.15</td>
<td>0.85</td>
<td>160</td>
</tr>
<tr>
<td>Correlation</td>
<td>0.15</td>
<td>0.85</td>
<td>184</td>
</tr>
<tr>
<td>MANOVA</td>
<td>0.15</td>
<td>0.85</td>
<td>81</td>
</tr>
</tbody>
</table>

Source: Result of G-power 3.1

The above table shows the result of sample size required for the study. It is found that out of five proposed tests, the highest number of 495 sample size is found for Z-test. Hence the researcher has decided to collect data from the 500 customers of public sector banks in the study area.

1.8 Sampling Technique

The study is based on the opinion of the users of e-banking services of public sector banks in Madurai District. In the study area around 200 public sector banks are functioning. Moreover the customers availing e-banking services of public sector banks in the study area is unknown and infinite in nature. Hence, the required number of 500 customers is selected by using snow ball sampling method of non - probability sampling technique.
1.9 Period of the Study

The primary data were collected during the months of September 2013 - January 2014.

1.10 Profile of the study area

1.10.1 Historical Background of Madurai

Madurai, the capital city of Madurai district, is situated in the bank of the river Vaigai. It is an ancient city known for its age old legacy and agile of contemporary modern lifestyle. There is an interesting tale behind the city. The enchanting fragrance of Jasmine flowers all around Madurai gives one an enthralling warm welcome into the town. Madurai is the third largest city and the second largest municipal corporation in Tamil Nadu.

The city is closely associated with Tamil language and the Tamil Sangam. Madurai is also called by different names like "City of Jasmine", "Temple City", "City that never sleeps" (Thoonga nagaram) and "City of four junctions" (Naanmada koodal). History of Madurai goes back to the 3rd Century B.C. and the city is mentioned by Megasthenes. The city was the principal administrative and cultural centre of the Pandyan dynasty which ruled over the southern parts of Tamil Nadu and Kerala till the first half of the 14th Century A.D. In about 1311, the Pandian dynasty was overthrown by the Delhi Sultanate which established the province of Malabar. Madurai was later on absorbed into the Vijayanagar Empire. The viceroy of the Vijayanagar Empire established the Madurai Nayak Kingdom and ruled as independent kings from 1559 to 1736. After a brief period of occupation by Chanda Sahib and the Carnatic kingdom, Madurai was annexed by the British East India Company in 1801.

1.10.2 Location and Geographical Area

Madurai district was bifurcated into Madurai and Theni districts in 1996 and retained Madurai as its head quarters. The district lies between 77 Degree–00” and 78
Degree-30” of the eastern longitude and between 9 Degree-30 “ and 10 Degree-30” of the northern latitude. It has an area of 3741.73 Sq. Km and is bounded on the west by Theni district, on the north by Dindigul district, on the east by Sivagangai district and on the south by Virudhunagar district.

1.10.3 Topography

The district has got 2 revenue divisions, 6 municipalities, 11 blocks and 7 taluks respectively. The district is endowed with a semi-arid tropical climate with normal rainfall of 827.1 mm as against 923.1 mm for the state. The predominant soil type is red soil. This type of soil is found common in Madurai, Melur, Thirumangalam, Usilampatti and Vadipatti blocks with a combination of red soil and black soil.

1.10.4 Small Scale Industrial units in Madurai District

The growth of small-scale industries in the industrial map of Madurai district shows the concentration of industries in a few areas/ pockets like Madurai, Thirumangalam and Usilampatti. The other areas of the district have got less significance. The foot loose industry is the single most enterprise still dominating the district. Economy. The location of industries is the prime task. Instead the district economy has managed to turn its fate and now ranks top among the most industrial centres in Tamil Nadu, accounting for a sizeable part of the State’s revenue. Though the industrial growth is confined to few pockets, existing industrial climate will give way to attract new investment opportunities in Engineering, chemical, readymade garments, paper and textile industries in this district.

1.10.5 Large Scale Industries

The district is not witnessing strong presence of medium scale enterprises. There are 9 large scale enterprises in this district. They are mostly engaged in manufacturing Sugar, Solar power generation, Calcium Sennoside, Tyre and Tube, Rubber and Automobile component, Textile, Non ferrous metal power and Milk products, Concrete sleepers etc.
1.10.6 Service Enterprises in Madurai district

Service Enterprises in Madurai district is witnessing a strong presence of service enterprises and foot loose industries. Major contribution has emerged from service enterprises. However, they have not been evenly distributed across the district. The following service enterprises are having visible presence in Madurai regions. Hotel, Hospitality enterprises, Hospital, restaurant, Industrial consultancy, educational instructions ,web site developing, two wheelers- four wheelers servicing and repairing, tutorial, BPO, private telephone, Marriage Bureaus, electric and electronic goods servicing and repairing, Travel Agency, Gas Agency, Construction consultancy, Marriage items hiring, industrial Testing Labs. Advertising Agencies. Marketing Consultancy, Typing Centres, Desk Top Publishing. Internet Browsing/Sett ing up of Cyber Cafés, Auto Repairs, Services, Garages, Laundry and Dry, Cleaning X-Ray clinic, Cleaning. Animal dispensary, Servicing of Agricultural Farm equipment e.g. Tractor, Pump, Rig, Boring Machines etc, Weigh Bridge, Designing, Blue Prints and enlargement of drawing/designs facilities, ISD/STD Booths, EDP Institutes established by Voluntary Associations/Non-Govt. Organizations, installation and Operation of Cable TV Network, Beauty Parlors and Creches.

1.10.7 Potential areas for service industry

The main acres for service industries are BOP, Hotels, Hospitality enterprises, Hospitals, IT - enabled, Documentary Films on themes like Family Planning, Social Forestry, Energy Conservation, and Commercial Advertising, Industrial laundry , Tailoring., Pathological labs, integrated diagnostic centre, Sub-contracting Exchanges (SCXs) established by Industry Associations, Beauty Parlors and Creches. Fitness centre for men and women, Glass engraving, Ladies and gens Hostel, House Keeping and Office and equipment maintenance, Hygienic Broiler (Beef), chicken, Mutton shop, Interior decoration, Industrial design and layout making. Logistic centre, Material Handling, Metal coating, Office Automation, Parcel servicing, private carrier, upholstery , Power System maintenance, Manpower agency, Weighing bridge repairing and maintenance, digital printing, Embroidering , chamki work and repacking of agriculture produce.
1.11 Data processing and Tools of analysis

After the completion of data collection work, filled up interview schedules were edited and gathered data were entered into SPSS for analysis. IBM 21 version of SPSS is used for analysis of data. Then normal distribution test is applied to use whether parametric or non-parametric test for analysis of data and it is found that the collected data were normally distributed. Hence the researcher has decided to apply the following parametric and non-parametric tests for analysis.

1. Independent Sample ‘t’ test
2. ANOVA
3. Chi square test
4. Correlation
5. Multiple Linear Regression and
6. MANOVA

1.11.1 Independent Sample ‘t’ test

Independent Sample ‘t’ test is used to determine when the means of the two sample distribution differ significantly from each other. It compares the means of two different samples. In SPSS ‘t’ test is used for analysis of large size of sample called as Z test.

1.11.2 ANOVA

The ANOVA test is used to determine the impact of independent variables on the dependent variables. The one-way analysis of variance (ANOVA) is used to determine whether there are any significant differences between the means of one or more independent (unrelated) groups on dependent variable.
1.11.3 Chi Square test

Chi-squared test is used to measure whether two variables are independent or dependent on each other. For this purpose the expected count is calculated using actual count and comparison is made. The following formula is used for chi-square test.

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

Where,

$\chi^2 = \text{Pearson's cumulative test statistic, which asymptotically approaches a } \chi^2 \text{ distribution.}$

$O_i = \text{an observed frequency;}$

$E_i = \text{an expected (theoretical) frequency, asserted by the null hypothesis;}$

$n = \text{the number of cells in the table.}$

Chi-squared distribution, shows $\chi^2$ on the x-axis and P-value on the y-axis. The chi-squared statistic can then be used to calculate a p-value by comparing the value of the statistic to a chi-squared distribution. The number of degrees of freedom is equal to the number of cells $n$, minus the reduction in degrees of freedom, $P$.

1.11.4 Correlation

The word correlation refers to the relationship between two variables. The common usage of the word correlation refers to a relationship between two or more objects such as ideas, variables and the like. Correlation measures the strength of the relationship between two variables $x$ and $y$. A correlation greater than 0.8 is generally
described as strong, whereas a correlation less than 0.5 is generally described as weak. These values can vary based upon the "type" of data being examined. A study utilizing scientific data may require a stronger correlation than a study using social science data.

1.11.5 Multiple Linear Regression

The goal of Multiple Linear Regression (MLR) is to model the relationship between the explanatory and response variables. Multiple linear regression attempts to model the relationship between two or more explanatory variables and a response variable by fitting a linear equation to observed data. Every value of the independent variable $x$ is associated with a value of the dependent variable $y$. The model for MLR, given $n$ observations, is:

$$y_i = B_0 + B_1x_{i1} + B_2x_{i2} + \ldots + B_px_{ip} + E_i \text{ where } i = 1, 2, \ldots, n$$

The fitted values $\hat{\beta_0}, \hat{\beta_1}, \ldots, \hat{\beta_p}$ estimate the parameters of the population regression line.

1.11.6 MANOVA

MANOVA procedures are multivariate, significance test analogues of various univariate ANOVA experimental designs. MANOVA, as with its univariate counterparts typically involve random assignment of participants to levels of one or more nominal independent variables; however, all participants are measured on several continuous dependent variables. MANOVA variations are used in somewhat different applications, they all have one feature in common: they form linear combinations of the dependent variables which best discriminate among the groups in the particular experimental design. In other words, MANOVA is a test of the significance of group differences in some $m$-dimensional space where each dimension is defined by linear combinations of the original set of dependent variables.

In the present study above tests are used to know the impact of socio economic variables and their association between attitudes of the respondents towards e-banking
services. In addition to the above tests, percentage, mean and standard deviation have been also used to analyse the data.

1.12 Limitations of the study

The following are the limitations of the present study.

• The researcher has collected data from the users of e-banking services of public sector banks functioning in Madurai District only. Hence the findings of the study are applicable only for the study area.

• The opinion of the employees of public sector banks about the e-banking services are not analysed due to paucity of time.

1.13 Scheme of Chapterisation

The present study is presented in six chapters.

The first chapter entitled Introduction and Design of the Study comprises of introduction about computerization of banking sector, scope of the study, statement of the problem, objectives, hypotheses, methodology, sampling design, tools of analysis and scheme of chapterisation.

The second chapter captioned Review of Literature is designed to present the previous studies analysed for the present study.
The third chapter entitled **Impact of Technology in Banking Sector** presents the impact of technology in the banking sector and its various facets e-banking in particular.

The fourth chapter namely **Socio economic profile of the respondents and their opinion about e-banking services** describes the socio economic variables of the respondents and their opinion about e-banking services of public sector banks under various dimensions.

The fifth chapter namely **Analysis of customers attitude towards e-banking services** is framed to analyse the attitude of the customers towards the e-banking services of public sector banks in the study area. It analyses the relationship between the socio economic variables, account details of the respondents and their attitude towards e-banking services.

The sixth chapter entitled **Summary of Findings, Suggestions and Conclusion** presents the summary of findings of the study and suggestions to improve e-banking services of public sector banks to attract more customers than the existing level. This chapter ends with scope for further research.